BONTON ASSOCIATES

TECHNICAL MEMORANDUM IN SUPPORT OF CORRECTIVE ACTIONS FOR WATER SYSTEM IMPROVEMENTS

SUPPORT FOR TALLULAH, LOUISIANA MUNICIPAL WATER SYSTEM

PROJECT NO. 177180

REVISION 0

JANUARY 3, 2025

CONTENTS

FIGURES

TABLES

1.0 Introduction

The Corrective Action Plan (CAP) report for Tallulah reviews the current capital improvement plan (CIP) and assesses its suitability for compliance with EPA and Louisiana Department of Health (LDH) regulations. It evaluates treatment systems, distribution systems, and sampling protocols based on findings from Task 1 (Appendix A) and Task 2 (Appendix B). The report includes plans for a recommended sampling plan for the maintenance of the water distribution system that meets regulatory requirements and a staffing inventory with necessary training. It also provides a recommended implementation schedule and cost estimate.

1.1 Background & Purpose

Tallulah, Louisiana, the Parish seat of Madison Parish, has faced significant challenges with its water system in recent years, including boil water advisories, water outages, and insufficient funds for repairs. The system has also experienced numerous water main breaks and extensive leaks. To address this crisis, in June 2024 the Tallulah City Council voted to enter into a joint receivership with the State. Under the direction of the Governor's Office of Homeland Security and Emergency Management Preparedness (GOHSEP), Bonton Associates has been tasked with enforcing drinking water regulations, issuing administrative compliance orders, and managing civil actions and receiverships. The purpose of this report is to convey the CAP recommendations for the rehabilitation of the WTP at the City of Tallulah, Louisiana.

Although there are violations relating to the City of Tallulah's water distribution system, Burns & McDonnell's scope did not include evaluation of the distribution system, including assets, condition, work orders, system pressure, or any kind of qualitative or quantitative analysis. Recommendations in this Technical Memorandum relating to the distribution system are focused on master planning and development of strategic improvement plans rather than specific solutions, other than items identified as improving the overall baseline reliability of the system.

1.2 Assessment of Existing Condition and Outstanding Violations

The list of outstanding violations of Louisiana Sanitary Code and subsequent administrative orders are documented in Table 4 of Appendix A and are summarized below by category.

Descriptions relating to the existing conditions of equipment in the subsequent sections reflect the condition at the time of the site visit by Burns & McDonnell. Any changes to condition occurring after the site visit are not captured in this Technical Memorandum.

1.2.1 Groundwater Wells

1.2.1.1 Existing Condition Assessment

The Tallulah water treatment plant (WTP) has five (5) wells fed from the Mississippi River Alluvial aquifer; Wells 2, 3, 4, 5, and 6. The wells do not have variable frequency drives (VFDs) and operate at a constant speed. During normal operation, the plant runs Wells 3 and 6 simultaneously; however, during the site visit by Burns & McDonnell, Wells 3, 5, and 6 were in operation, causing hydraulic overloading of downstream equipment.

1.2.1.2 Open Violations

There are several open violations relating to the groundwater wells for Tallulah's water supply. See Item No. 55 to 71 of Table 4 in Appendix A which include:

- Well #2:
    - Item No. 55: Non-functional flowmeter needs to be replaced.
    - Item No. 56: The casings, motors, discharge piping, and upper well terminal of several wells are in poor condition due to heavy iron deposits, rust, and algae. These areas must be cleaned, evaluated for repairs, and recoated.
    - Item No. 57: Well vent screens are rusty and need to be replaced. Screen must be 24 mesh wire; vent must be turned-downward and terminate at least 24-inches above ground surface level.
    - Item No. 58: Broken or leaking sample tap.
    - Item No. 59: Pressure gauge on discharge needs to be added.
    - Item No. 71: Protective guards around the rotating shafts are missing. Belts, gears, rotating shafts, and electrical wiring should have proper shields to prevent injury.
- Well #3:
    - Item No. 60: Well vent screens are rusty and need to be replaced. Screen must be 24 mesh wire; vent must be turned-downward and terminate at least 24-inches above ground surface level.

- Item No. 61: The casings, motors, discharge piping, and upper well terminal of several wells are in poor condition due to heavy iron deposits, rust, and algae. These areas must be cleaned, evaluated for repairs, and recoated.
- Item No. 62: Well waste line is leaking.
- Item No. 63: Non-functional flowmeter needs to be replaced.
- Item No. 64: Packing is too loose causing the lubrication well to flood constantly. Tighten the packing to prevent flooding and deterioration of the well.
- Item No. 71: Protective guards around the rotating shafts are missing. Belts, gears, rotating shafts, and electrical wiring should have proper shields to prevent injury.

- Well #4:
  - Item No. 65: Lantern rings are leaking and must be replaced.
  - Item No. 66: The casings, motors, discharge piping, and upper well terminal of several wells are in poor condition due to heavy iron deposits, rust, and algae. These areas must be cleaned, evaluated for repairs, and recoated.
  - Item No. 67: Relocate the well vent to where the spray from the water lube does not wet the vent and cause it to become clogged. Well vent must be turned-downward and terminate at least 24-inches above ground surface level.
  - Item No. 68: Well is not in service and needs to be properly plugged and abandoned. Properly plug and abandon wells that are not used as a source of water. Provide written documentation to LDH stating the well has been properly plugged and abandoned.
  - Item No. 71: Rotating shafts are missing protective guards and must be installed. Belts, gears, rotating shafts, and electrical wiring should have proper shields to prevent injury.
- Well #5:
  - Item No. 69: Well vent water lubrication spray is causing the vent to become clogged and needs to be relocated. Well vent must be turned-downward and terminate at least 24-inches above ground surface level. The casing vent screen is missing and must be installed. Screen must be 24 mesh wire; vent must be turned-downward and terminate at least 24-inches above ground surface level.
  - Item No. 70: The casings, motors, discharge piping, and upper well terminal of several wells are in poor condition due to heavy iron deposits, rust, and algae. These areas must be cleaned, evaluated for repairs, and recoated.

- Item No. 71: Protective guards around the rotating shafts are missing. Belts, gears, rotating shafts, and electrical wiring should have proper shields to prevent injury.

- Well #6:
  - Item No. 72: The casing vent terminates immediately above the concrete slab. Well vent must be turned-downward and terminate at least 24-inches above ground surface level.

1.2.2 Aerators

1.2.2.1 Existing Condition Assessment

The primary functions of aeration are to improve water quality by 1) removing dissolved gases such as carbon dioxide and hydrogen sulfide, and 2) oxidizing dissolved metals such as iron. The two aerators at the Tallulah WTP are currently receiving source water beyond the functional hydraulic limit of the equipment. Significant overflows and ruptures in the blower housing were observed, causing significant water loss. Due to significant corrosion and overall condition, it is anticipated that the blowers are not functional, and the aerators are likely not able to provide significant process benefit in their current state.

1.2.2.2 Open Violations

There is only one open violation relating to the aerators at Tallulah WTP. See Item No. 2 in Table 4 of Appendix A.

- Item No. 2: The aerator closest to the filter gallery was found to be leaking heavily.

1.2.3 Clarifiers

1.2.3.1 Existing Condition Assessment

The primary functions of the solids contact clarifiers are to improve water quality by settling out suspended solids, reducing turbidity, and removing hardness, metals, and other contaminants. Both Clarifiers 1 and 2 were observed in operation with sludge blanket levels near the bottom of the effluent launders, which can result in solids carryover. The weirs of Clarifier 1 appeared to be submerged most of the time while operating which indicates a hydraulic bottleneck downstream of the Clarifier. Additionally, the launders in Clarifier 1 were not level (i.e., were separating from the perimeter of the tank wall and slumping) and this contributes to the submerged weir issue. The clarifiers are both operating without functioning mixing units and scraper mechanisms, which limits treatment effectiveness and ability to manage solids. The malfunctioning equipment may be caused by the significant buildup of lime solids on the mechanical equipment at the point of chemical injection. Sludge discharge flows were originally permitted to discharge off-site, no exact location or information on discharge location has been provided to-date. The sludge discharge lines are no longer in use and the sludge stream flows by gravity to the nearby creek. The Tallulah WTP NPDES permit was requested from the City for review but not received.

1.2.3.2 Open Violations

There are several open violations relating to the clarifiers at the water treatment plant. See Item No. 9 to 12 of Table 4 in Appendix A.

- Item No. 9: Clarifier #1 has a broken ball valve.
- Item No. 10: The Flash mixer for Clarifier #1 is non-functional.
- Item No. 11: Scraper drive for Clarifier #1 is non-functional.
- Item No. 12: The weirs of both Clarifier 1 and Clarifier 2 need cleaning.

1.2.4 Sludge Blowdown Pumps

1.2.4.1 Existing Condition Assessment

The sludge blowdown pumps were designed to remove the settled sludge from the bottom of the clarifier and transfer it to sludge handling or disposal facilities. This process is intended to help maintain the efficiency of the clarifier by preventing the buildup of excessive sludge, which can interfere with the settling process and reduce the quality of the treated water. At Tallulah WTP, the sludge blowdown pumps were originally used to discharge lime sludge to an off-site holding pond. The lines were abandoned, and the sludge is now discharged to the creek that runs through the WTP site. The reason for the sludge line abandonment to send discharges off-site is unknown, and currently discharges are sent to the nearby creek.

The sludge pumps at Clarifiers 1 and 2 are non-functional, leading to improper discharge of lime sludge. It is unknown if returning the sludge pumps to working order will allow the City to discharge to the permitted discharge location. The sludge lines to the holding pond will require additional evaluation for integrity and continuity. These problems can significantly impact the plant's ability to maintain consistent water production and quality, potentially leading to service interruptions and non-compliance with safety standards.

1.2.4.2 Open Violations

There are two (2) open violations relating to the sludge pumps. See Item No. 42 and 43 in Table 4 of Appendix A.

- Item No. 42: The sludge pumps serving Clarifier #1 and #2 are non-functional.
- Item No. 43: The sludge pump to the sludge pit is not connected and lime water is being pumped to a nearby small ditch located at the side of the treatment plant instead of to the approved sludge pits as originally designed and permitted.

1.2.5 Intermediate Clearwells

1.2.5.1 Existing Condition Assessment

The primary function of the intermediate clearwells is to provide contact time for disinfectants to inactivate pathogens. There are three (3) steel above-grade intermediate clearwells at Tallulah WTP. Carbon dioxide and chlorine solution are dosed into Intermediate Clearwell 1 and Intermediate Clearwell 2. Due to plant hydraulics, both of these chemicals are essentially double-dosed into the water that flows through Intermediate Clearwell 1 (Clarifier 1 effluent flows directly into Intermediate Clearwell 1, Clarifier 2 effluent flows directly into Intermediate Clearwell 3, Intermediate Clearwells 1 and 3 converge into Intermediate Clearwell 2.). The steel tank walls and roofs are in extremely poor condition, with significant corrosion that has left the tanks open to the atmosphere which could result in another LDH violation.

1.2.5.2 Open Violations

There are two (2) open violations relating to the intermediate clearwells. See Item No. 45 to 48 in Table 4 of Appendix A.

- Item No. 45 & 47: The southeast and northeast clearwells (Intermediate Clearwell #1 and #2) are in poor condition due to lime scale, pinhole leaks (indicated by rust streaks), and rust. The clearwells must be cleaned and evaluated for repairs.
- Item No. 48: An open hatch on the southeast clearwell (Intermediate Clearwell #2) poses a contamination risk and must be kept closed.

1.2.6 Low Service Pumps

1.2.6.1 Existing Condition Assessment

The three (3) low service pumps (LSPs) are used to pump water from the intermediate clearwells through the pressure filters and into the ground storage tank located on-site. At the time of this report, LSP #2 has been out of service for over six months and the emergency diesel-powered backup pump has been in continuous operation over that time, leaving the plant with no redundancy. The pump plates on the LSPs indicate an apparent maximum working pressure of 175 psi, which may have contributed to the steel vessel failures for the out of service pressure filters if improperly operated. The steel pressure vessels are designed for 75 psi working pressure.

1.2.6.2 Open Violations

There are two (2) open violations relating to the LSPs. See Item No. 40 and 41 in Table 4 of Appendix A.

- Item No. 40: The Low Service Emergency Pump 3 is currently non-operational.
- Item No. 41: There is a leaking valve located between the low service pumps and the pressure filters.

1.2.7 Pressure Filters

1.2.7.1 Existing Condition Assessment

The purpose of the pressure filters at the Tallulah WTP is to remove suspended solids, particulate iron and manganese, natural organic material, bacteria, viruses, and other contaminants from the water. Pressure Filters #3 and #4 are completely offline, and the remaining two (2) cannot be taken offline for maintenance due to the demand of the water system. The two (2) offline filters are reportedly inoperable because of steel vessel rupture(s) caused by over pressurization of the filters in the past. Leaks were observed in the online filters at locations where severe metal corrosion on steel plating has occurred.

There was no apparent standard operating procedure (SOP) for filter backwash. Filter backwashing was reportedly not performed based on any of the normal industry triggers (i.e., run time, turbidity, or headloss), but rather it is performed when there are any number of other process issues at the plant. The isolation valve for the filter nearest the operations room is not functioning, which requires that both filters are taken out of service during the backwash procedure. During a backwash performed during the site visit, one of the isolating valves on the filter feed header failed to fully close, which could result in contaminating the feed header with backwash waste if left uncorrected.

1.2.7.2 Open Violations

The pressure filters at the water treatment plant have several open violations. See Item No. 2, and Item No. 51 to 54 in Table 4 of Appendix A.

- Item No. 2: Filter #2 was leaking and rusting from the access ports.
- Item No. 51: The filter media for all filters requires inspection and potential replacement.
- Item No. 52: Many filter gauges for headloss / pressure differential are non-functional. This has resulted in staff backwashing filters on an arbitrary interval of 72 hours. The backwash pressure valves must be replaced.
- Item No. 53: There is a rupture in the steel vessel of Filter #4, which has put Filter #3 and Filter #4 out of service for an extended time, as the filters operate as a pair. There is a broken gate valve between Filters #1 and #2. There is a broken butterfly valve between Filters #3 and #4.
- Item No. 54: The backwash drain is constantly open during normal operations and the filter access hatches are leaking.

1.2.8 Ground Storage Tank

1.2.8.1 Existing Condition Assessment

The ground storage tank (GST) at the Tallulah WTP receives effluent from the pressure filters and stores water before it is pumped to the distribution system from the high service pump station (HSPS). The exterior of the GST was in poor condition and there is a reported sunken portion of the tank which accumulates standing water and poses a risk to contamination of the finished water storage before entering the distribution system.

1.2.8.2 Open Violations

The ground storage tank at the water treatment plant has several open violations. See Item No. 29 to 36 in Table 4 of Appendix A.

- Item No. 29: The access ladders are often left unlocked, posing security risks.
- Item No. 30: Drain valves are cracked and leaking.
- Item No. 31: Portions of the surrounding fence are missing, and vegetation is overgrown.
- Item No. 32 & 33: The tank's exterior paint is in poor condition, and tree roots have grown into the tank's base.
- Item No. 34 & 35: The overflow screen was broken, the roof was sagging, and the hatch was rusted.
- Item No. 36: The tank interior had not been inspected in several years.

1.2.9 High Service Pumps

1.2.9.1 Existing Condition Assessment

There are three (3) high service pumps (HSPs) which are used to provide finished water to the distribution system and fill the elevated storage tank. A valve on the exterior of the HSP Station feeding the elevated tank is reportedly seized half-open and cannot be manually actuated, which plant staff indicated was contributing to system pressure issues. The HSPs are rebuilt approximately every six (6) months, indicating potential alignment problems.

Past pump repairs and rebuilds indicated lime sludge carry-over into the pumps which is wearing out mechanical components and causing calcium deposit buildup. One (1) additional natural gas-powered backup pump is present in the HSP station, but it is not functional and has been out of service for several years.

1.2.9.2 Open Violations

There are three (3) open violations relating to the High Service Pumps. See Item No. 37 to 39 in Table 4 of Appendix A.

- Item No. 37: Broken seal on High Service Pump #3.
- Item No. 38: Reliance on generator power without a secondary standby source.
- Item No. 39: Leaking valves.

1.2.10 Elevated Storage Tank

1.2.10.1 Existing Condition Assessment

The elevated storage tank aids in maintaining consistent pressure and supply throughout the distribution system. The elevated tank was not observed to provide any supplemental storage or pressure to the system during the low-pressure events when system pressure was less than 30 psi. This is due to the fact that the elevated tank requires approximately 58 psi to fill, based on the name plates at the elevated storage tank. Based on Burns and McDonnell's observations, which are further described in Appendix B, when HSP #2 is out of service there is not sufficient pressure with HSP #1 and #3 to fill the elevated storage tank.

1.2.10.2 Open Violations

There are several open violations relating to the elevated storage tank. See Item No. 23 to 27 in Table 4 of Appendix A.

- Item No. 23: There is erosion under the center riser column which must be investigated and remediated. Grading to slope away from the elevated tank center column needs to be evaluated.
- Item No. 24: The fence surrounding the tank is overgrown with vegetation and poses an issue for security.
- Item No. 25: The overflow screen is broken and needs to be replaced with a #4 mesh.
- Item No. 26: The sample tap is non-compliant, due to the presence of threading and a hose.
- Item No. 27: The pressure gauge used for measuring water level in the tank is broken.

1.2.11 Backup Power

1.2.11.1 Existing Condition Assessment

The existing generator is operational but does not currently supply power to the entire plant, and its capacity to run all necessary components during an emergency is unknown. A load test is required to evaluate the ability to provide power to the site. There are backup engine-powered pumps that must be operational to supply water in emergencies: One (1) for the HSPS which was reportedly not operational, one (1) for the LSPs which was actively in operation, and one (1) for Well #3 which is not operational.

1.2.11.2 Open Violations

There is one (1) open violation relating to the backup power system at the water treatment plant, with multiple components. See Item No. 28 in Table 4 of Appendix A.

- Item No. 28: Insufficient dedicated standby power to provide community with water supply and non-community water supply to provide treatment and pumping to distribution during times of outage to meet average daily demand during month of maximum water use. Well #3 power take-off (PTO) is missing safety shielding.

1.2.12 Distribution System

1.2.12.1 Condition Assessment

Burns & McDonnell did not perform any qualitative or quantitative analysis or assessment of the Tallulah distribution system. The following is a summary of findings that are based on data provided by the City and by LDH.

Since 2014, the city of Tallulah, Louisiana, has faced significant challenges with its water distribution system including issuing numerous boil advisories and LDH-issued water quality violations. Boil advisories have been related to equipment failures, including pumps, the malfunction of an Entergy transformer causing an electrical panel failure at the WTP, loss of pressure, and multiple water line leaks throughout the city. Customer complaints have been reported due to the frequency of boil advisories, the taste and odor of the water supplied, and the presence of iron and manganese, which result in discolored water. Incurred violations from LDH relating to water quality are for exceedances for iron, manganese, copper, lead, and arsenic.

1.2.12.2 Open Violations

There are several open violations relating to the distribution system. See Item No. 13 to 22 in Table 4 of Appendix A.

- Item No. 13: The system does not have adequate valving in place to isolate branches of the distribution system during leak or pipe burst events, resulting in water system outages for line repairs.
- Item No. 14: Disinfectant residual levels measured in the distribution system did not satisfy the requirements of the Code of Federal Regulations and Louisiana Administrative Code 51.
- Item No. 15: There is no emergency water source agreement with neighboring systems.
- Item No. 17 & 22: Apparent non-compliance with the Lead and Copper Rule relating to lead levels exceeding the action limit requiring follow-up sampling and potential exceedance of lead or copper from tap samples.
- Item No. 18: Levels of total coliform measured in the distribution system did not satisfy the requirements of the Revised Total Coliform Rule.

- Item No. 19: Levels of manganese in the distribution system exceed the EPA Secondary Maximum Contaminant Limit and the LDH Health Advisory Level.
- Item No. 21: Lacking formal reporting of Monthly Chlorine Residual at Additional Chlorine Residual Sites.

1.2.13 Chemical Storage and Handling

1.2.13.1 Existing Condition Assessment

The lime feed system doses hydrated lime to the solids contact clarifiers. Each clarifier has a dedicated mix tank with overflow line that feeds into the center of the clarifier with no redundancy. The lime mix tanks have been continuously overflowing into the associated secondary containment, which was also overflowing, and lime solution was present on the floor and nearly every surface inside and outside of the lime building. It was observed that the drain line from the secondary containment basin was intended to discharge within piping that likely connects into the clarifier blowdown piping. However, these containment drainpipes were cut or clogged, resulting in significant deposits of lime on the ground surface between the clarifiers and the lime building. During lime transfer between hoppers, it was observed that blower air used to move the lime was discharging to atmosphere outside of the building without any kind of dust collection or dust arrestor.

WTP has equipment to store and feed liquid alum coagulant to the solids contact clarifiers, however, the chemical lines have been severed before they reach the clarifiers and the system is currently not in service.

The chlorine feed system consists of two (2) in-service 150-lb chlorine gas cylinders with vacuum regulators. The chlorine solution line exits the chlorine storage shed and is routed along the ground to Intermediate Clearwells 1 and 2. This solution pipe had previous repairs using pipe splices and other means and was observed to be submerged in standing water between the intermediate clearwells. At a gas feed of 108 ppd, the chlorine residual was measured on the filter effluent at 11.2 mg/L, which is believed to be the detection limit of the equipment used. This value in excess of the EPA's regulatory limit for chorine residual which is 4.0 mg/L.

The carbon dioxide (CO_2) feed system consists of a liquefied gas tank and evaporator unit and is fed as a gas from a single line which splits to Intermediate Clearwell 1 and Intermediate Clearwell 2. Carbon dioxide gas is dosed for recarbonization of the clarifier effluent for pH adjustment and stabilization.

1.2.13.2 Open Violations

The water treatment plant has several open violations relating to chemical storage and handling. See Item No. 3 to 5, 7, and 8 in Table 4 of Appendix A.

- Item No. 3: Lime is spilling into the plant due to an uncovered slaking/mixing box.

- Item No. 4: Leaking chemical from the aluminum sulfate chemical metering pump.
- Item No. 5: The lime room lacks essential protective gear and safety equipment.
- Item No. 7: Lacking secondary containment for aluminum sulfate storage tanks.
- Item No. 8: Chlorine cylinders are improperly restrained and exposed to sunlight.

1.2.14 Operations, Testing, and Reporting

1.2.14.1 Existing Condition Assessment

Generally, the raw water quality for Tallulah contains high levels of aluminum, iron, manganese, and alkalinity. Arsenic and hardness levels are generally moderate, though Well #6 raw water arsenic has been measured above the MCL. The raw water pH ranges between 6.2 to 8.1 s.u. The constituents of arsenic, iron, and manganese all exert an oxidant demand on the water (i.e., require an oxidant to change the oxidation state for removal), and the water treatment plant has faced challenges with removal of said constituents. The Tallulah system introduces oxidation via aerators and by adding free chlorine for disinfection.

Plant staff do not have a finished water sample point identified for chlorine residual measurement; this should be established and monitored frequently.

1.2.14.2 Open Violations

There are three (3) open violations relating to operations. See Item No. 6, 49, and 50 in Table 4 of Appendix A.

- Item No. 6: Colorimeters for chlorine residuals are not being verified against standards.
- Item No. 49: The water system is not implementing and enforcing its formal cross-connection control program.
- Item No. 50: The WTP is not maintaining annual testing records for customers required to install backflow prevention devices, with several devices not tested in years. The system must maintain a comprehensive list of customers with backflow prevention devices and ensure annual testing records are up to date.

2.0 Assessment of Corrective Actions Needed

There are four (4) components to the overall Corrective Action Plan (CAP) for the City of Tallulah's Water System: 1) Emergency Stabilization, 2) Governance Adjustments, 3) Phase I – Baseline Reliability Improvements, and 4) Phase II – Final System Sustainability Improvements. Of these four components, the Phase I and Phase II portions are discussed in this report, while the Emergency Stabilization and Governance Adjustments are provided by others. Supplementing the four components are other additional corrective actions and programmatic developments for improving the distribution system, which were identified to aid in addressing outstanding violations either directly or indirectly through corrective actions.

Implementing any of the capital improvement projects as part of Phase II – Final System Sustainability Improvements is anticipated to require an extended period of time, as discussed further in Section 3.1 below, and will not address the immediate need to stabilize the water treatment plant, increase reliability, and address open violations relating to water quality. As such, LDH requested an evaluation of interim alternatives to provide reliable water and costs associated with each and for decision making relating to appropriate allocation of American Rescue Plan Act (ARPA) funding for improvements to the water system. Five (5) interim options were evaluated, and costs were developed by Bonton Associates; these are listed below and are further defined in Appendix D. These options included:

- Option 1 – Minimal Intervention Approach: Proceed with minimal intervention (continue emergency repairs and limited interventions as necessary to maintain current level of service). This would be captured as part of the Emergency Stabilization component of the CAP.
- Option 2 – Sequential Improvement Approach: Use a phased strategy to address repairs and improve reliability. This would be captured as part of the Phase I – Baseline Reliability Improvements component of the CAP.
- Option 3 – Temporary Mobile Pressure Filters: Use of temporary mobile pressure filters to replace the failed filters. This would be captured as part of the Phase I – Baseline Reliability Improvements component of the CAP.
- Option 4 – Temporary Mobile Treatment Plant: Use of temporary mobile treatment unit to bypass the existing plant. This would be captured as part of the Phase I – Baseline Reliability Improvements component of the CAP.
- Option 5 – Temporary Tie-in With Walnut Bayou: Temporary tie-in to nearest water service provider. This would be captured as part of the Phase I – Baseline Reliability Improvements component of the CAP.

Options 3 and 4 were eliminated from consideration, as there was minimal feedback from LDH on their viability, and they may not be an allowed solution for emergency stabilization based on restrictions for use of current federal and state funding. Option 5 would require additional coordination with the nearest water service provider and agreement with the appropriate board of directors.

Option 1 was selected by LDH as the most viable alternative due to the conditions associated with use of the available ARPA funding for the water system. Based on selection of Option 1, the City will need to account for costs associated with: installing two (2) insertion valves, replacement of three (3) HSPs per year, installation of new gate and check valves at the HSPS, monthly repairs at the HSPS, replacement of two (2) LSPs per year, installation of new gate and check valves, bi-monthly repairs at the LSPS, replacement of the diesel-powered LSP, continued plant operation, and training of operators. Costs for these items are developed and presented in Appendix D. These costs will be in addition to any of the selected CIPs for Phases I and II, and yearly/monthly costs will continue until any new plant infrastructure is installed and commissioned.

2.1 Phase I – Baseline Reliability Improvements

The purpose of the Phase I - Baseline Reliability Improvements component of the CAP is to identify and target upgrades to existing infrastructure which will aid in stabilizing operations and overall system reliability, allowing for continued operation of the existing WTP.

Infrastructure upgrades identified as part of Phase I are intended to both stabilize current operations at Tallulah WTP and to supplement the options presented in Phase II, these are as follows:

1. Supplemental Tie-in with Walnut Bayou (CA-1) – Install a connection point to the neighboring Walnut Bayou Water System to address immediate production deficits and provide a supplemental finished water supply.

2. Structural repairs to the ground storage facility (CA-2) – Pending findings of investigation and structural integrity assessment of the existing ground storage tank, repairs would include but not be limited to: removal and replacement of the existing tank roof, recoating of existing steel shell, temporary tanks, and necessary structural repairs to the tank to prolong the service life of the tank.

3. Upgrade the High Service Pump Station (CA-3) – Replace piping and valving in the HSPS and automate operations of the HSPs and valves.

4. Leak Detection and Repair Program (CA-4) – Performing strategic repairs of identified leaking areas within the distribution system which are assumed to be causing significant water loss. The City could consider a phased approach to replacement, using a more aggressive replacement strategy to target problematic areas, and transitioning to a more conservative replacement strategy based on any improvements to water quality and work orders relating to line breaks and leaks. Selection of mains for replacement may be

informed by areas in the distribution system which may be undersized or have pressure issues, or alternatively sections of water mains which have historically experienced breakages or leaks. Adopting an aggressive approach to water main replacement may require that Tallulah hire additional staff or contractor(s) to perform the necessary work.

5. Water Meter Replacement Program (CA-5) – Replacing 3,000 meters with advanced metering infrastructure (AMI) to address water loss, unbilled water due to leaks, line breaks, and unauthorized connections. The meters have the ability to transmit the collected data through commonly available fixed networks and are equipped with acoustic leak detection which provides a proactive approach to fighting water loss. Data gathered as part of these monitoring initiatives will enable water loss to be pinpointed and managed proactively. Reduction in water losses may decrease the net demand for the water system, which could result in lower capital expenditure requirements for future construction and facilitate lower annual operations costs.

6. Supplemental Water Purchase Agreement – Establish agreement with Walnut Bayou for water purchase agreement to augment water supply. Conditions will need to be coordinated with Walnut Bayou Board of Directors and any infrastructure upgrades to provide service will need to be evaluated. This item would be grouped with CA-1.

Phase I items for the Tallulah WTP are prioritized to be completed prior to the Phase II CIPs; as such, the ground storage tank (CA-2) and HSPS rehabilitation (CA-3) are not included in the Phase II Options covered in subsequent sections.

2.2 Phase II – Final System Sustainability Improvements

The purpose of the Phase II – Final System Sustainability Improvements component of the CAP is to present three primary capital improvement options to address open violations related to the water treatment plant and water quality issues requiring major investment of capital funds. As part of the CAP, two (2) of these options were evaluated and are discussed in the subsequent sections. Evaluation of a third option for purchasing wholesale water is recommended for consideration and is covered by others. Following evaluation of violations addressed, cost, and schedule, it is recommended that the City implement one (1) of the capital improvement projects (CA-6, CA-7, or CA-8) in addition to Phase I corrective actions (CA-1 through CA-5) and other additional corrective actions and improvements to achieve compliance (CA-9 through CA-18).

A comprehensive summary table of the open violations and which proposed Corrective Actions will directly or indirectly address each is included in Appendix C.

The Tallulah water system currently faces open violations relating to administrative fees, water treatment plant equipment, the City's ability to isolate portions of the distribution system, enforcement of cross-connection control, maintaining records of backflow prevention devices, water quality and sampling compliance issues in the distribution system, operator certification requirements, and various items relating to the elevated storage tank. The City will need to take corrective action using a combination of capital improvements and additional corrective actions

and improvements to achieve compliance with LDH. Capital improvements will encompass all corrective action items that require procuring and installing additional equipment, rehabilitation of equipment, or replacement of equipment. Additional corrective actions and improvements will include items such as reporting, training, and staffing, administrative fees, and proper operation of the water treatment system to promote compliance with regulatory requirements.

2.2.1 Equipment Redundancy Requirements

Louisiana Administrative Code (LAC) Title 51 requires that redundancy be provided for various components of a treatment process. This redundancy is essential for maintaining water quality and supply reliability, safeguarding public health, and ensuring compliance with regulatory standards. A summary of LAC Title 51 requirements for the capital improvements proposed in this Technical Memorandum are shown in Table 1 below.

Table 1: Redundancy and Sizing Requirements

Treatment Process Unit	Redundancy Requirement	Sizing Requirements	LAC Title 51 Sanitary Code Section
Aerators	Minimum of two (2) units	There are no explicit sizing requirements.	Part XII, Subchapter D, § 185.A
Clarifier (softening)	Minimum of two (2) units	Designed for the average daily flow of the maximum month such that the plant's design capacity can be met with one unit out of service.	Part XII, Subchapter D, § 175.G
Pressure Filter	Minimum of two (2) units	The filters shall be capable of meeting the average daily flow of the maximum month with one filter unit removed from service.	Part XII, Subchapter D, § 177.B
Pumps	Minimum of two (2) units	With any pump out of service, the remaining pump or pumps shall be capable of providing the maximum design capacity of that station.	Part XII, Subchapter B, § 217.A
Storage Tank	Minimum of one (1) unit	Storage facilities should have sufficient capacity, as determined from engineering studies, to meet domestic demands, and where fire protection is provided, fire flow demands.	Part XII, Subchapter C, § 225.C

Treatment Process Unit	Redundancy Requirement	Sizing Requirements	LAC Title 51 Sanitary Code Section
Groundwater Well	Minimum of two (2) wells[A]	The total developed groundwater source capacity, unless otherwise specified by the state health officer, shall equal or exceed the design maximum day demand with the largest producing well out of service.	Part XII, Subchapter C, § 169.B

Note [A] : In lieu of a second well, a connection to another approved water supply of sufficient capacity, if approved by the state health officer, is acceptable.

In addition to the lack of redundancy at the WTP due to various operation challenges, there are also challenges associated with sizing of process equipment due to the lack of historical system demand data, lack of flow metering at the WTP, and on-going issues related to water loss in the distribution system. Therefore, sizing requirements for equipment based on demands, flowrates, and engineering studies were not evaluated as part of this CAP. All equipment sizing is based on a nominal WTP hydraulic capacity of 1,150 gpm, which matches the rated hydraulic capacity of the solids contact clarifiers included in the 2021 design specifications developed by McManus Engineering.

2.2.2 Option 1 - Planned Capital Improvement Projects (CA-6)

An assessment of the City's existing capital improvement project (CIP) plans for the water system is required by CAP. The City does not have a CIP plan and therefore the assessment of planned CIP is instead based upon the recently bid projects by McManus Engineering[1] for: 1) drilling a new groundwater well to supplement supply, and 2) rehabilitation of the Tallulah WTP.

These projects are summarized below.

2.2.2.1 New Water Well (CA-6, CA-7, CA-9, and CA-10)

The new well would provide the City with one (1) additional well capable of producing 1,000 gpm of raw water to supplement the existing wells and increase the firm yield (capacity with the largest unit out of service).

The City has three (3) groundwater wells that are currently in-service and provide water to the treatment plant: Well #3, Well #5, and Well #6. Currently, the production from the in-service groundwater wells is estimated to be between 1,613 to 2,047 gpm, with an estimated firm capacity of 800 to 1,047 gpm. The water system demand is assumed to be approximately 1,150 gpm, as

[1] McManus Consulting Engineers, Inc. Contract A (dated February 2018, Revised July 2020, Revised September 2021) and Contract D (dated February 2018, Revised September 2021, Revised June 2022, Revised October 2023) packages

mentioned above. The estimated and measured flowrates for the in-service wells are summarized in Table 2 below.

Table 2: Groundwater Well Raw Water Production Capacity

	Raw Water Production	Source	Comments
Well #3	a. 380 gpm	a. Design documents by McManus Engineering	Raw water production cannot be measured and is assumed as the reported value by McManus Engineering.
Well #5	a. 420 gpm to b. 667 gpm	a. Design documents by McManus Engineering b. Flow totalizer measurement	
Well #6	a. 813 gpm to b. 1000 gpm	a. Flow totalizer measurement b. Design documents by McManus Engineering	

A new groundwater well producing 1,000 gpm (Well #7) would allow for the City to meet the assumed system demand with the largest well (Well #6) out of service. It is recommended that if a new Well #7 is developed, that the City plug and abandon Well #2, Well #3, and Well #4 which would address all violations relating to those three (3) wells. Plugging and abandoning existing, out of service, wells is referred to as CA-9 in Appendix C.

In addition to modifications to the existing Wells #5 and #6 to address corrective actions, it is recommended that variable frequency drives (VFDs) be added for Well #5, Well #6 and the new Well #7.

2.2.2.1.1 Suitability of Capital Improvement for Achieving Compliance

Drilling a new Well #7 at WTP does not directly address any of the open violations; however, this CIP does allow for the City to abandon existing wells with open violations while adding redundancy and firm capacity. Corrective action against open violations will require a combination of CIPs and additional corrective actions and improvements, which are covered in the subsequent sections. The proposed location (by McManus Engineering) of Well #7 is shown in Figure 1.

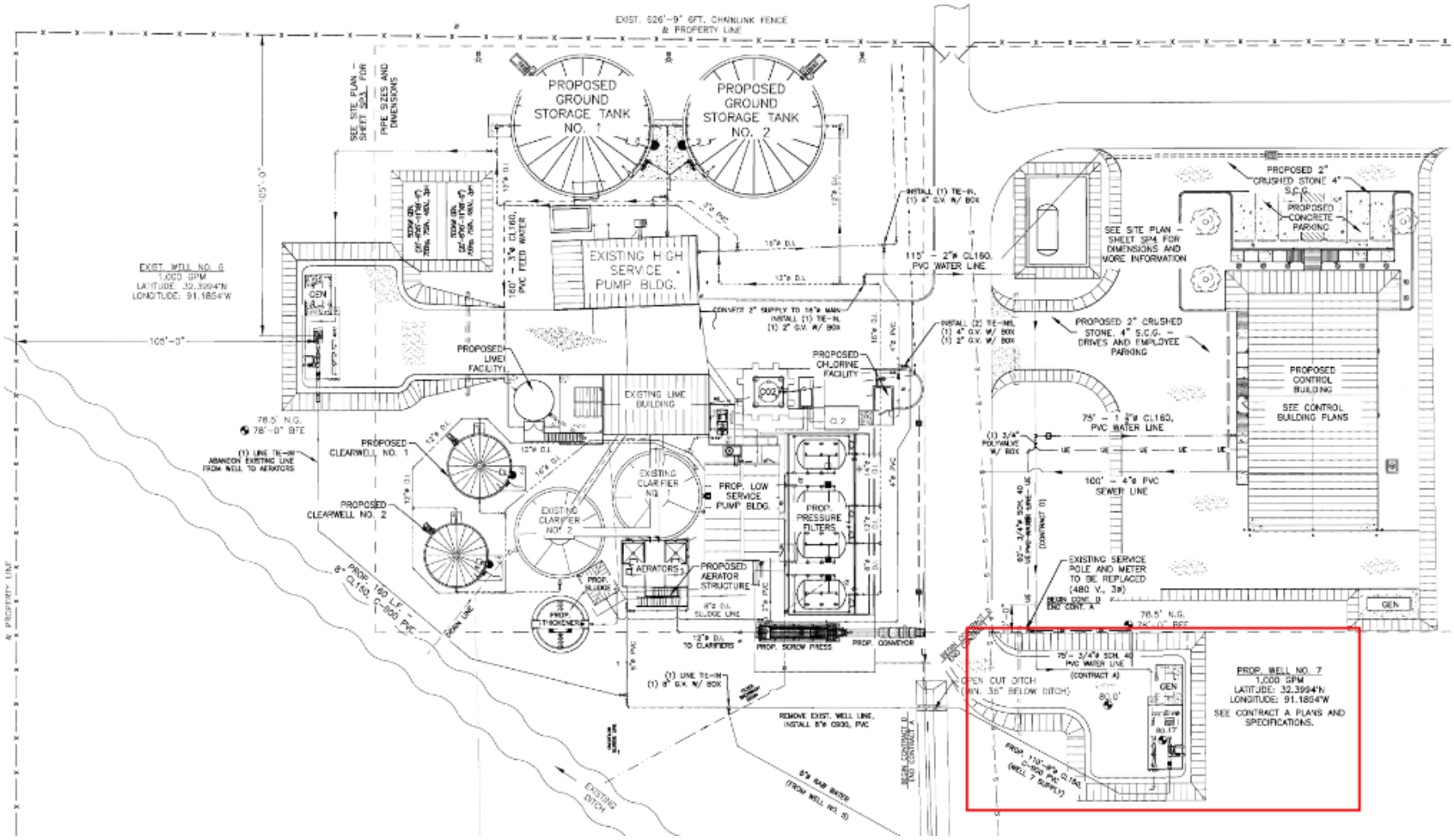

Figure 1: Proposed Location for New Well #7

Additional corrective actions will be necessary relating to any remaining in-service wells, which are assumed to be Well #5 and Well #6. Refer to Table 4 of Appendix A, Items No. 69 to 72. These actions are identified as CA-10 in Appendix C.

- Existing wells will need to be retrofitted with flowmeters (Wells #5 and #6 are currently fitted with flow totalizers).
- Well casing vents must be modified to terminate at least 24" above the ground surface and provided with 24 mesh screens to meet Louisiana Administrative Code (LAC) Title 51 requirements.
- Well #5 requires: cleaning, recoating, and a protective guard around all exposed mechanical and electrical equipment.

2.2.2.2 Water Treatment Plant Rehabilitation (CA-6)

The Tallulah WTP rehabilitation project, as designed by McManus Engineering, includes extensive equipment replacement, additions, and rehabilitation of existing equipment for continued use. A site plan from the McManus Engineering design is shown in Figure 1. These are summarized as:

- New Well #7 (mentioned above),
- New aerator platform,
- Two (2) new induced-draft style aerators,
- In-place rehabilitation of Clarifiers #1 and #2 with cleaning & recoating, new clarifier mechanisms, scrapers, and mixers,
- Two (2) new intermediate clearwells,
- New gravity thickener and polymer feed system,
- New low-service pump facility with four (4) new low service pumps,
- Four (4) new pressure filters with associated piping and valves,
- New chlorine building and feed equipment,
- New lime storage silo and feed equipment,
- New carbon dioxide storage tank and feed equipment,
- Rehabilitate the lime building to include alum feed equipment,
- Two (2) new sludge blowdown pumps and housing,
- New belt filter press dewatering equipment,
- New dewatered sludge conveyor,
- Three (3) diesel engine generators for backup power to the Well #5, Well #6, and new Well #7,
- Two (2) new backup generators for backup power to the WTP with new 4,000-gallon bulk diesel tank and containment,
- New administration, office, and laboratory building
- Reuse of improved HSPS and GST completed in Phase I.

2.2.2.2.1 Suitability of Capital Improvements for Achieving Compliance

The proposed CIP to rehabilitate the WTP will correct open violations relating to issues pertaining to the water treatment. Corrective action for the open violations pertaining to the elevated storage tank, administrative fees, the distribution system, and regulatory reporting and monitoring are not provided within this specific CIP and will require a mixture of projects and additional corrective actions and improvements and are covered in the subsequent sections.

In addition to the design documents by McManus Engineering, Burns & McDonnell recommends additional considerations or alternate approaches for portions of the proposed WTP rehabilitation due to the suitability for the treatment process, condition, age, and remaining service life of equipment at WTP. These considerations are as follows:

- Provide a raised concrete structure with cascade style aerators in lieu of induced-draft style aerators – the proposed induced-draft aerators are not well-suited for the very high levels of iron and manganese in the raw water. Induced-draft style aerators are expected to require additional maintenance and equipment outages due to particulate accumulation, as compared to cascade style aerators.
- Replace the existing clarifiers with new basins and clarifiers mechanisms – the clarifier steel tanks are in poor condition, and the structural integrity of the remaining steel plates is unknown.
- Provide a building to house the dewatering equipment – best practice is to provide controlled environment for mechanical equipment.
- Personal protective equipment (PPE) and functioning emergency shower and eye wash provisions are necessary in all chemical storage and feed areas (Item No. 5 in Table 4 of Appendix A)
- Provide storage and feed equipment for phosphate to be used for corrosion inhibition in the distribution system.

2.2.3 Option 2 - Greenfield Water Treatment Plant (CA-7)

Similar to Option 1, a new WTP would address all open violations related to the water treatment plant and provide the City with new water treatment infrastructure to replace the aging and failing existing WTP. It is assumed that a greenfield site for a new water treatment plant would be necessary due to a combination of site constraints, maintaining existing plant operations, and environmental considerations. Re-using the existing site for a new WTP will need to be evaluated as part of a detailed design effort. The proposed greenfield site is located at the corner of Johnson St and Kimbrough Dr, as directed by the City. An aerial image showing the proposed greenfield site relative to the existing WTP site is in Figure 2 below.

Figure 2: Tallulah WTP and Potential Greenfield Site Aerial Locations

Due to significant concern about the condition of the existing assets, difficulty associated with rehabilitation design and construction, higher costs associated with rehabilitation of an existing plant, unforeseen circumstances that may arise during construction, and bringing any existing infrastructure up to building code specifications, a new water treatment plant is recommended for consideration.

The treatment processes, buildings, and function of the plant is similar to that of Option 1, using a design flow of 1,150 gpm, and would include the following:

- New Well #7 (noted above),
- Elevated aerator platform (concrete) with two (2) cascade style aerators,
- Two (2) solids contact clarifiers,
- Gravity thickener and polymer feed system,
- Low-service pump facility with three (3) low service pumps,
- Three (3) pressure filters with associated piping and valves,
- Chlorine building and feed equipment,
- Lime storage silo and feed equipment,

- Sulfuric acid storage tank and feed equipment,
- Phosphate storage tank and feed equipment,
- Two (2) sludge blowdown pumps and housing,
- Dewatering building,
- Dewatering centrifuge,
- Dewatered sludge conveyor,
- Two (2) backup generators for backup power to the WTP and new bulk diesel tank with containment,
- New administration, office, and laboratory building
- Reuse of improved HSPS and GST completed in Phase I.

A process flow diagram depicting the proposed treatment plant is shown in Figure 3 below.

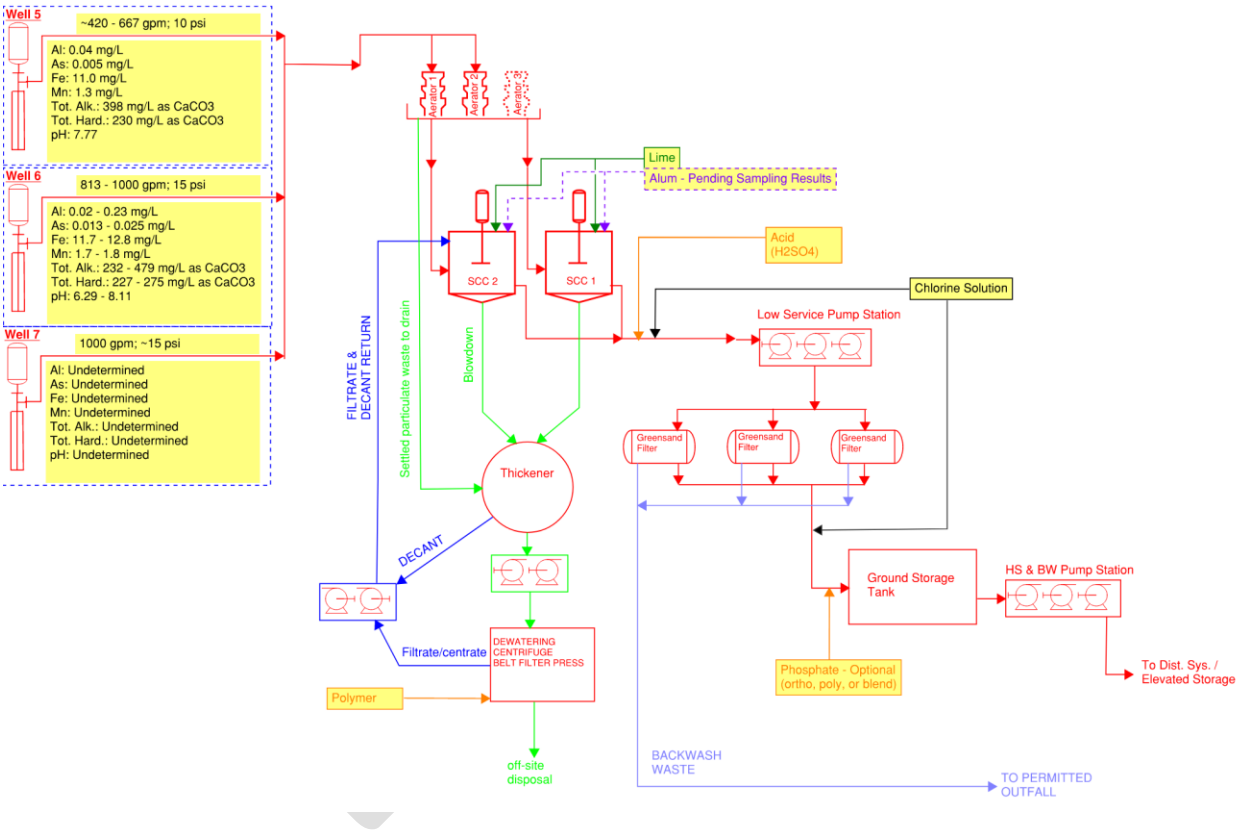

Figure 3: Proposed Greenfield WTP Process Flow Diagram

2.2.3.1 Suitability of Capital Improvements for Achieving Compliance

The proposed new WTP will correct open violations relating to issues pertaining to water treatment. Corrective actions for the open violations pertaining to the elevated storage tank, administrative

fees, the distribution system, and regulatory reporting and monitoring are not provided within this specific CIP and will require a mixture of projects and additional corrective actions and improvements. Projects and additional corrective actions and improvements are covered in the subsequent sections.

2.2.4 Option 3 - Purchase Wholesale Water (CA-8)

Another consideration for addressing the open violations relating to the water treatment plant is to purchase wholesale treated water from the nearest water system, Walnut Bayou. The connection to Walnut Bayou's system will generally require a wholesale purchase contract, construction of a new water main between the Tallulah distribution system and the Walnut Bayou distribution system, and it is expected that additional capital investment will be required to increase the capacity of the Walnut Bayou infrastructure to reliably meet the demand of the Tallulah system. It is recommended that prior to any connection to a water wholesaler, an evaluation be conducted of water quality for both systems including disinfectant type, water stability, flushing programs, and that coordination with LDH occur. A detailed evaluation of Option 3 is not included in this Technical Memorandum and is under evaluation by others.

2.2.5 Option 4 – Utility Consolidation

The final consideration for Phase II is consolidating utility assets with another water system. This option is not discussed in this report and is under evaluation by others.

2.3 Additional Corrective Actions and Improvements

Tallulah WTP is currently facing compliance issues regarding operator certification and reporting standards. In addition to operator certification and reporting deficiencies noted by LDH, there are violations associated with maintenance activities for Tallulah WTP. Each of these additional corrective actions and improvements are discussed in the following sections.

2.3.1 Water Treatment Plant Operator Training and Certification (CA-12)

The plant has only one (1) Level 4 certified operator, while the remaining plant staff are not certified operators. Given Tallulah's population size and WTP's continuous 24-hour operation, LDH requires a Level 3 certified operator on every shift to oversee operations. To become a certified Water Treatment Plant Operator in Louisiana, there are specific educational and experience requirements, a certification exam, and an accumulation of necessary points based on education and experience. The points required for each level are shown in Table 3. The minimum educational requirement is a high school diploma or GED. Points are awarded for formal education, approved training courses, and relevant work experience as shown in Table 4. Recertification is required every two (2) years. To renew certifications in water categories, operators must complete a minimum of 16 contact hours or 8 hours per certification, whichever is greater.

Table 3: LDH Operator Certification Level Required Points

Certification Level	Initial Required Points	Recertification Points Required
Operator-In-Training	0	0
Class 1	1	16
Class 2	2	16
Class 3	5	24
Class 4	8	32

Table 4: LDH Operator Education and Experience Points

Education/Experience	Points
Each year of formal college education (30 semester hours)	1
Each year of formal graduate-level education	1.5
Each semester hour (college-level courses)	0.033
Each 40-hour approved training course	0.10
Each 8 hours of approved continuing education	0.02
Each 1 hour of approved continuing education	0.0025
Each year of qualifying operator experience	1
Each year of qualifying related experience	0.5
Each year of qualifying supervisory experience	1.5

To achieve certification, a combination of education and experience is required for each level. If the exam, education, and experience criteria are met, an operator can progress from one level designation to another without time delay. For Classes 1 and 2, points can be from experience alone, while for Classes 3 and 4, no more than 75% of the total required points can be obtained

from either education or experience alone, see Table 5. This structured approach allows operators to have a balanced mix of education and practical experience, which is beneficial for effectively managing water treatment facilities.

Table 5: LDH Operator Certification Training Points Summary

	Level 1	Level 2	Level 3	Level 4
Total Points Required	1	2	5[A]	8[A]
Proposed Points from Years of Experience	1	2	3.75	6
Proposed Points from Training Courses / Continuing Education	0	0	1.25	2

Notes:
A - Class 3 and Class 4 operator certification requires no more than 75% of required points are obtained from either training or experience. It is assumed that points gained through experience are preferential to points gained from classroom training.

In Tallulah, Louisiana, one (1) Level 3 certified WTP operator is required to be on shift at the Tallulah WTP at all times due to Tallulah having a population size of about 5,600 (2024) and the plant having multiple shifts per 24-hour day. A proposed basic organizational chart for the water system reporting structure is shown in Figure 4. There are nine (9) WTP operator certification exams offered by the Louisiana Department of Health each year. Three (3) of these exams are open and do not require an in-person course completion to register and take the exam. The other six (6) exams are closed and require a 32-hour in-person course prior to taking the certification exam. For first-time certified operators, a paper application and a completed Law and Rule exam must be mailed or emailed to the Louisiana Department of Health. The education courses offered by the Louisiana Rural Water Association (LRWA) vary in cost depending on the instructor and range from $300 to $400 per course. For detailed information on how to become a certified WTP operator in Louisiana, visit the Louisiana Department of Health's Operator Certification page[2].

[2] Louisiana Department of Health's Operator Certification page: https://ldh.la.gov/page/operatorcertification

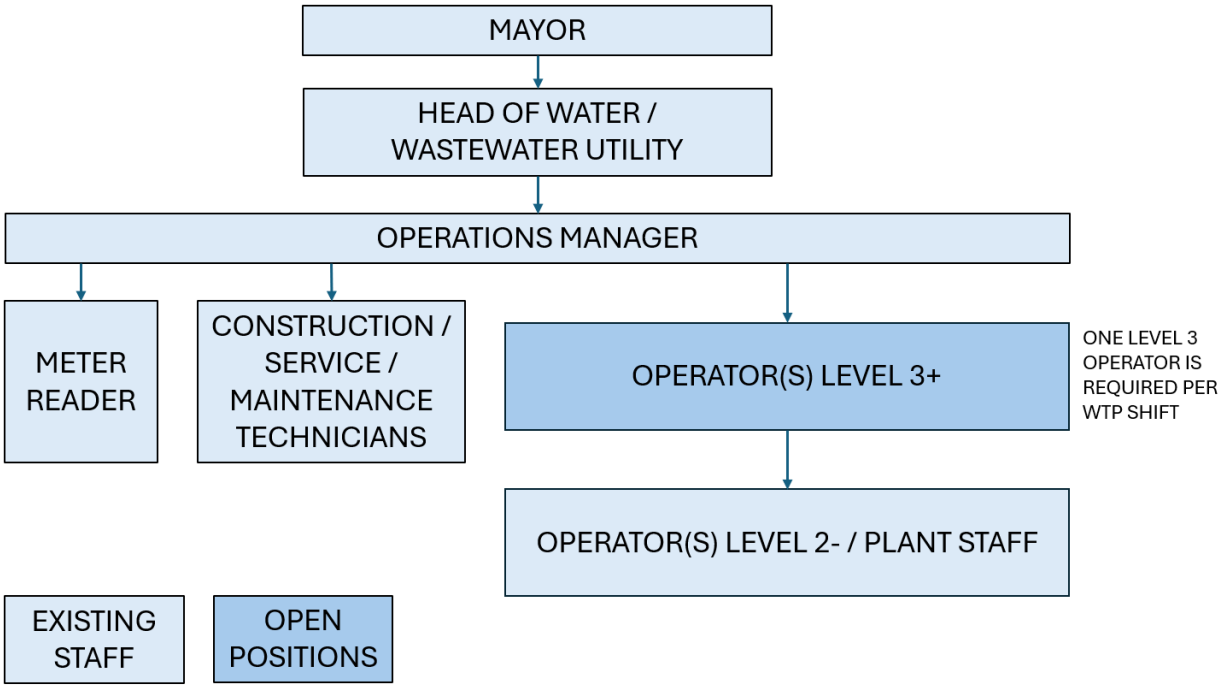

Figure 4: Basic Organizational Chart for Water System Direct Reporting

2.3.1.1 Plan for Operator Certification

It is advised that Tallulah WTP encourages its current operators to pursue a minimum of a Level 3 certification. Achieving Level 3 certification allows operators to meet the minimum requirements mandated by LDH for water treatment operators. By investing in the professional development of their staff, Tallulah WTP can better comply with regulatory standards. It is recommended that Tallulah set a goal to obtain two (2) Level 3 operators through either hiring independent contractors, promotion of current staff/operators, or hiring of Level 3 operators not currently employed by the City. An additional recommendation to operator certification is to implement requirements for multiple staff to achieve a minimum of Level 2 operator certification within 24 months of being notified.

2.3.2 Water Quality and Regulatory Sampling (CA-13)

Generally, the raw water quality for Tallulah contains high levels of aluminum, iron, manganese, and alkalinity. Arsenic and hardness levels are generally moderate, though Well #6 raw water arsenic has been measured above the MCL. The raw water pH ranges between 6.2 to 8.1 s.u. The constituents of arsenic, iron, and manganese all exert an oxidant demand on the water (i.e., require an oxidant to change the oxidation state for improved removal), and the water treatment plant has faced challenges with removal of said constituents. Raw water quality data is shown in Table 2 of Appendix A.

The City of Tallulah has multiple open violations relating to water quality and regulatory sampling, including:

- The colorimeters used for measuring chlorine residuals are not regularly checked against standards to ensure their accuracy, leading to potential discrepancies in chlorine levels.
- Failure to maintain the minimum required chlorine residual in its distribution system. This issue is compounded by coliform levels that are out of compliance, indicating possible contamination. This issue and the location or source of contamination needs to be investigated further and considered as part of any water main replacement program.
- Missing chlorine residual reporting forms, which are required for regulatory compliance and tracking of chlorine residual.
- Apparent non-compliance with the Lead and Copper Rule relating to lead levels exceeding the action limit requiring follow-up sampling and potential exceedance of lead or copper from tap samples.

2.3.2.1 Plan for Compliance with Water Quality Sampling and Reporting

Achieving compliance for the violations relating to water quality and regulatory sampling may be achieved through a combination of direct and indirect actions, as necessary. Direct actions involve specific corrective measures that directly address the issues. Indirect actions involve broader changes that, while not directly linked to violations, create an environment that supports compliance.

Direct actions recommended are as follows:

- Develop and implement a routine purchasing schedule for additional colorimeter standards or calibration reagents
- Create a standardized sampling plan for the water treatment plant and distribution system for in-house monitoring of water quality parameters and to make treatment decisions when known regulatory exceedances are recorded. Print a manual of standard compliance monitoring forms to be filled out during every shift for the review of senior operator(s). A proposed sampling plan is provided in Table 6 below.
- Conduct a corrosion control study on the finished water in the distribution system

Indirect actions recommended are as follows:

- Implement a system of Standard Operating Procedures (SOPs) for all components of the water treatment plant, including written directions and hands-on training for all:
    - Unit operations for all process/mechanical, and electrical equipment at the WTP,
    - Chemical dosing, and

- Laboratory and regulatory testing.

Table 6: Proposed Sampling Analytes and Locations

Sample Location	Frequency	Analyte(s)
Raw water (Discharge from each well)	Daily	1. pH 2. Alkalinity (total) 3. Hardness (total and calcium) 4. Iron (total and dissolved) 5. Manganese (total and dissolved) 6. Arsenic
	Periodically	1. Total organic carbon (TOC) 2. Ammonia
Aerator effluent	Daily	1. pH 2. Alkalinity (total) 3. Iron (total and dissolved) 4. Manganese (total and dissolved) 5. Arsenic
Clarifier effluent	Daily	1. Turbidity 2. pH 3. Alkalinity (total) 4. Hardness (total and calcium) 5. Iron (total and dissolved) 6. Manganese (total and dissolved) 7. Arsenic
	Periodically	1. TOC
Filter influent	Daily	1. pH 2. Iron (total and dissolved) 3. Manganese (total and dissolved) 4. Chlorine residual
Filter effluent	Daily	1. Turbidity 2. pH 3. Alkalinity (total) 4. Hardness (total and calcium) 5. Iron (total and dissolved) 6. Manganese (total and dissolved) 7. Arsenic 8. Chlorine residual
	Periodically	1. TOC
Finished water	Daily	1. Turbidity 2. pH 3. Alkalinity (total) 4. Hardness (total and calcium) 5. Iron (total and dissolved) 6. Manganese (total and dissolved) 7. Arsenic 8. Chlorine residual
	Periodically	1. TOC

Sample Location	Frequency	Analyte(s)
Distribution system	Daily	1. Turbidity 2. pH 3. Alkalinity (total) 4. Hardness (total and calcium) 5. Iron (total and dissolved) 6. Manganese (total and dissolved) 7. Arsenic 8. Chlorine residual
	Periodically	1. TOC
Clarifier Blowdown & Filter Backwash	Pending requirements from NPDES discharge permit	2. pH 3. Chlorine residual 4. TDS 5. Arsenic 6. Iron (total) 7. Manganese (total)

2.3.3 Maintenance At the Elevated Tank (CA-14)

There are five (5) open violations relating to the elevated storage tank. These items are generally maintenance related and are summarized below.

- Ground soil erosion below the center column of the tank,
- Overgrown vegetation around the perimeter fence,
- Broken pest screen on the overflow of the elevated tank,
- Sample tap connection need to be replaced with a non-threaded version,
- The pressure gauge used to read tank level needs to be replaced.

2.3.3.1 Proposed Corrective Actions

The corrective actions required for the elevated storage tank are as follows:

- Conduct a geotechnical survey of the soil below and surrounding the elevated storage tank to determine if there are any recommended improvements to soil compaction or additional concrete foundations required.
- Direct operators or maintenance staff to address the following items:
    - Grub and clear all vegetation within a 6-ft zone outside of the perimeter of the elevated storage tank security fence, or to the extent practical,
    - Install a new pest screen on the overflow outlet,
    - Remove existing threaded sample tap and replace with a non-threaded tap,
    - Replace the pressure gauge in-kind.

2.3.4 Standard Operating Procedures

It was observed during site visits that Tallulah WTP does not have any Standard Operating Procedures (SOPs) for water quality sampling and operation of major equipment. SOPs provide uniformity in operations, enhance safety by detailing protocols, aid in training new employees, will aid in maintaining regulatory compliance, and improve overall plant efficiency. Recommended SOPs for the Tallulah WTP include but are not limited to the aerators, clarifiers, low service pumps, pressure filters, and high service pumps. SOPs are also recommended for chemical handling and storage, chemical dosing, pump operations, water quality testing (i.e., laboratory analysis), and record keeping, and reporting.

2.4 Development of Distribution System Improvements Program

A program for improving the City's distribution system through water master planning, creating asset inventories, and hydrant flushing is recommended for addressing open violations and the long-term resiliency of the distribution system. Water master planning will establish a foundation for strategic and systematic capital improvements with associated prioritization.

2.4.1 Water Master Planning (CA-15)

The last completed water master plan (WMP) for the City of Tallulah is unknown and it is recommended that the City develop a new WMP to assess existing and future water system capacity and storage needs; and identify long-term capital improvements required for future development, system expansion, and condition-related improvements. The results of that assessment could be used to further develop capital improvement planning to address critical assets over a long-term period, with targeted strategies to address high-priority items. This effort could include planning for renewal and replacement of aging infrastructure over its anticipated service life.

2.4.1.1 Recommended Corrective Actions

The corrective actions for water master planning are as follows:

- Create a water master plan document within the next 24 months to develop prioritization of capital improvement projects, water main replacements, system expansion, storage needs, system demand, and condition-related improvements.

2.4.2 Create ArcGIS Inventory of Assets (CA-16)

The City does not currently have an ArcGIS inventory of distribution system assets which is a useful tool to record location of assets, equipment tagging, track open work orders, document necessary replacements, historical information for assets, and can be used for water system modeling. It is recommended that the City create an ArcGIS inventory of assets as part of a WMP effort and that the information be used to leverage an asset management plan.

2.4.2.1 Recommended Corrective Actions

The corrective actions for ArcGIS inventory are as follows:

- Create an inventory of all known assets in the Tallulah water system within the next 12 months, as this will be a necessary step in creating a hydraulic model and will be used in the water master plan.

2.4.3 Hydrant Flushing Program (CA-17)

Staff from the City have reported hydrant flushing exercises have sometimes required several minutes of flushing to turnover the water in areas of the distribution system, based on the color of the water being flushed. Additionally, the City has experienced challenges with maintaining water quality in the distribution system, particularly low chlorine residuals and elevated manganese. Chlorine residual is a function of many factors such as initial dose, water age, and chemical oxidant demand. Flushing will allow the system to turn-over more quickly and achieve appropriate chlorine residual levels which might otherwise be depleted due to water age. Hydrant flushing is recommended to promote turnover of water within the distribution system. Flushing is recommended for systems that experience issues with water quality and maintaining disinfectant residual throughout the distribution system, which would support avoiding future violations relating to chlorine residual.

2.4.3.1 Recommended Corrective Actions

The corrective actions for hydrant flushing are as follows:

- Develop and execute a flushing plan for the water system using a unidirectional flushing approach, with flushing occurring at least every 3 months and frequency should be evaluated periodically for effectiveness in achieving water quality goals.

2.4.4 Lead and Copper Rule Revisions Compliance

The EPA issued the final Lead and Copper Rule Revisions (LCRR) on January 15, 2021. The LCRR represented the first major update to the Lead and Copper Rule in 30 years and required water utilities to prepare and maintain lead service line (LSL) inventories, required modifications to lead and copper sample locations and protocols. Additionally, if triggered, water utilities are required to perform and implement corrosion control studies and/or lead service line replacement.

The EPA mandated the effective date of the LCRR to be December 16, 2021, requiring all systems with any LSLs to prepare and submit to its State regulatory agency the LSL inventory, along with an LSL Replacement Plan and publicly accessible inventory by October 16, 2024.

On November 30, 2023, EPA announced the proposed Lead and Copper Rule Improvements (LCRI), which included modifications to the LCRR requirements. This update was primarily intended to focus on the replacement of 100% of lead pipes in drinking water systems within 10 years of the promulgation of the legislation. This will also require that Tallulah identify any unknown materials on the system-side and customer-side of the water service. Per correspondence with LDH, the LSL inventory for the Tallulah water system has been submitted and approved.

On October 8, 2024, the EPA finalized the Lead and Copper Rule Improvements (LCRI), which introduced significant updates to the Lead and Copper Rule Revisions (LCRR). The LCRI mandates

the replacement of all lead service lines within 10 years, lowers the lead action level from 15 parts per billion (ppb) to 10 ppb, and enhances public outreach and notification requirements. Water systems are required to annually inform all persons at a service connection with a lead, galvanized requiring replacement (GRR), or lead status unknown service line about the material of their service line. This notification must also be provided to customers if they are different from the person served at the connection. Notifications must be issued within 30 days after completing the baseline inventory and repeated annually until the service line is no longer classified as lead, GRR, or lead status unknown.[3] The EPA has allocated funding to support these efforts through the Bipartisan Infrastructure Law, particularly in disadvantaged communities.

Water quality sampling data from the 2023 Consumer Confidence Report indicates that lead has been detected in exceedance of the action limit within the distribution system, which may indicate lead service lines within the distribution system. Additionally, the results may indicate that water stability needs to be investigated, or a corrosion control study be performed.

2.4.4.1 Recommended Corrective Actions

The corrective actions required for lead and copper exceedances are as follows:

- Create a standardized sampling plan for the water treatment plant and distribution system for in-house monitoring of water quality parameters and to make treatment decisions when known regulatory exceedances are recorded. Print a manual of standard compliance monitoring forms to be filled out during every shift for the review of senior operator(s).This would be covered as part of CA-13.
- Conduct a corrosion control study on the finished water in the distribution system. This would be included as part of CA-15.
- Develop lead service line replacement plan to be executed over the next 10 years. This could be included as part of CA-15 and CA-16.

[3] EPA LCRI Technical Fact Sheet on Public Education Requirements: https://www.epa.gov/system/files/documents/2024-10/final_lcri_fact-sheet_public-education.pdf

3.0 Implementation Of Options

In consideration of the information provided in previous sections of the Technical Memorandum, the following CIP implementation options are discussed in further detail:

- Option 1: Rehabilitate Existing WTP and Construct New Well #7
- Option 2: Construct Greenfield WTP and New Well #7

For both options, the schedule and cost of their implementation will be presented in more detail in the following sections. Connection to Walnut Bayou's system to provide treated drinking water into Tallulah's distribution system (Option 3), is being developed by others and therefore its implementation is not included in detail herein. There is no quantitative prioritization structure for the various options presented to achieve compliance; however it is recommended that the corrective actions are implemented as quickly as possible.

A significant consideration for Option 2 is whether the City will acquire new land or utilize existing land for a greenfield WTP site. Purchasing new land for the site was not included in development of opinions of costs or schedules. Both the opinions of cost and the implementation schedule would be impacted by the need to purchase land for the new greenfield site. The feasibility of re-using the existing site for a new WTP will need to be further evaluated as part of a preliminary engineering report or detailed design effort.

3.1 Implementation Schedule

Due to the immediate need for stabilization of the water delivery for the residents of Tallulah, consideration for the implementation schedule included both traditional design-bid-build (DBB) and progressive design-build (PDB) project delivery methods. In the implementation of either Phase II Option, it is recommended that the Phase I items are all implemented to improve system reliability in the interim.

For Option 1, Tallulah may consider rebidding the existing McManus Engineering documents (this would be the third bid of these documents). Yet, as noted previously, there are recommended additions to the McManus Engineering design (e.g., adding housing of various mechanical equipment areas) that require some additional design phase prior to bid and/or construction. The McManus design would also need to be validated prior to re-bidding the documents. The implementation schedules for a DBB delivery method for Option 1 is shown below in Figure 5**Error! Reference source not found.**. The design phase duration shown in the schedule for Option 1 reflects the assumption that a full re-design of the rehabilitation will be required, as the design documents by McManus may not be usable by another engineering firm under a DBB project delivery method. The McManus documents would be used as a basis of design.

A single delivery schedule is provided for Option 1, representing a DBB approach. In this schedule, it is assumed that the existing design documents will not be used, and the design duration is for a full re-design. Reuse of the McManus design is not likely to occur because of proposed changes and additions discussed in this report which would not be conducive to PDB project delivery. The construction schedule has additional time in it as well due to risk associated with working within an existing facility where conditions are not fully known. Rehabilitation of aging and poorly maintained existing facilities, while also keeping the facility online, presents significant challenges. The project schedule anticipates identification of additional rehabilitation requirements over the course of the Work. The schedule also anticipates reduced productivity due to the nature of selective rehabilitation work. Project completion will likely be driven by long-lead electrical procurement which occurs after the general contractor has been awarded a contract.

For Option 2, the scope is slightly different from Option 1, in that for a greenfield location, all new information is needed – e.g., land acquisition (if existing site cannot be used for new WTP), surveying, geotechnical engineering, subsurface utility exploration, and permitting activities. The proposed implementation schedule for Option 2 is shown in Figure 6**Error! Reference source not found.**, which includes both traditional DBB and PDB project delivery methods. A significant consideration for the implementation schedule of Option 2 is the availability of siting for the new WTP. As mentioned, there are concerns relating to available space, maintenance of plant operations, and environmental considerations with using the existing site; therefore, it is assumed that a greenfield site will be required for the new WTP. Re-using the existing WTP site will need to be evaluated during a preliminary engineering report or detailed design effort.

The PDB schedule is improved in Option 2 by leveraging opportunities to procure equipment early and issue early works packages so that construction and design activities can be progressed simultaneously. In the Option 2 PDB scenario, preliminary engineering planning would occur concurrently with the City's land acquisition and permitting efforts.

The Option 1 and Option 2 schedules both convey similar timelines when utilizing a DBB approach. One of the key schedule drivers on DBB is that the long lead equipment procurement will not occur until after the project has been awarded to a general contractor. With this procurement timing, the project schedule will be at the mercy of production schedules of the longest lead equipment, which is typically electrical equipment. It is common in today's market for a project to be "complete," yet waiting on final electrical distribution equipment to arrive to provide power and start-up the system.

The Option 1 implementation schedule indicates the potential schedule extensions that come from rehabilitating unknown/unforeseen conditions and the increased precautions and mitigation required to safely implement the improvements in a facility that is in such extremely poor operating condition. In contrast, Option 2 is working from a clean slate, where construction is unencumbered by existing infrastructure. Under Option 2 implementation, the PDB approach provides the City an opportunity to provide a stabilized water system to the residents more quickly. The following

paragraphs will provide additional discussion on the early procurement and early works construction packages that would be utilized in the PDB approach.

Early procurement of long lead equipment is one of the key benefits of progressive design build. Option 2 includes several engineered equipment and electrical components that currently have long lead times in the market – including electrical equipment (generators, power distribution line-ups), lime silos and feed systems, filtration systems, and dewatering equipment. Procuring these items based on a preliminary design provides two advantages to the schedule. First, the equipment goes into the production schedule for the supplier, providing an additional level of confidence to the construction schedule with known delivery dates. Second, the design can progress more efficiently around selected equipment. This allows the engineers to optimize design solutions such as size buildings and operational areas, as well as piping layouts, based on actual equipment dimensions and general arrangements rather than sizing for a variety of options or configurations that may be submitted by a general contractor after the bid and then revising based on submitted equipment.

Early procurement packages also necessitate early involvement with Louisiana Department of Health (LDH). Prior to placing purchase orders for process equipment that is identified for early procurement, the process requirements and design basis for these packages would be submitted to LDH for review. This is typical for non-traditional delivery models, and this approach has been successfully implemented to improve project schedules across multiple municipalities and agencies.

In addition to early procurement, the construction team will be providing input to the design team to prioritize design of elements that can be constructed while detailed design is completed. This would allow the construction team to issue early works packages for select activities. For Option 2, early works packages may include items such as earthwork and site preparation, foundations, well installation, and construction of building shells. Combined with early procurement, early works packages give the construction team a head start while the design is completed, ultimately providing up to 12 or more months of schedule improvement.

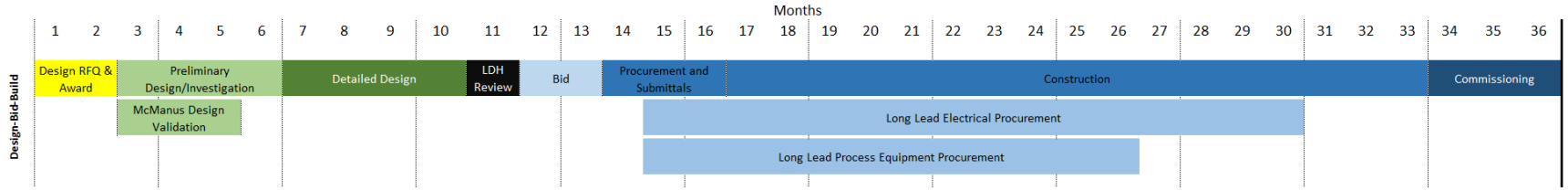

Figure 5: Option 1 Rehabilitation of Tallulah WTP (plus New Well #7) Proposed Implementation Schedules

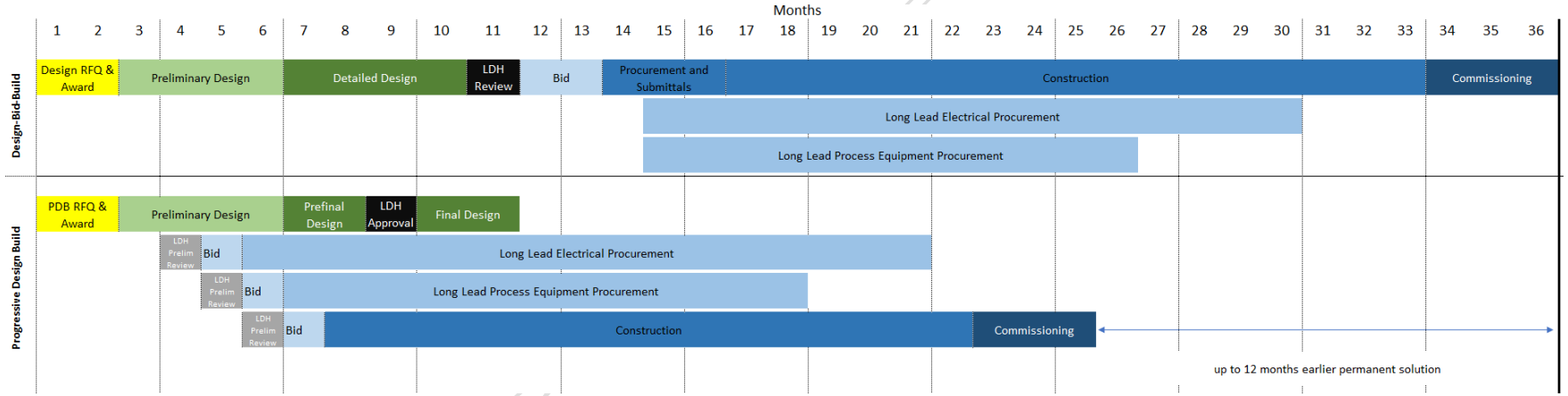

Figure 6: Option 2 Greenfield WTP (plus New Well #7) Proposed Implementation Schedules

3.2 Implementation Cost

Opinions of probable cost (OPCs) for capital improvements previously discussed are provided in this section of the Technical Memorandum. The following narrative generally outlines the methodology used to create probable construction cost budgets.

- Direct cost estimated to include all labor, equipment, and materials to install the work described, including Subcontractor and Design-Builder Overhead and Profit. Design-Builder site supervision and general conditions include site superintendent, project manager, safety manager, contractor field office and laydown yard.
- Direct cost estimates based on historical market pricing and independent cost build-ups.
- Project specific vendor/subcontractor pricing was not received.
- Excludes costs for future maintenance, right-of-way acquisition, utility costs, utility relocations, and other Owner construction phase services. Other project costs are to be carried separately by the Owner.
- American Iron and Steel (AIS) and federal prevailing wages are included.
- Excludes cost impacts associated with specific funding sources including, but not limited to, Build America, Buy America (BABA), Diverse Business requirements, or additional administrative requirements.
- Contingency is separate from the construction estimate and not included in the direct cost items. Contingency covers costs resulting from typical design progression and scope development through the project lifecycle (additional pay items, quantity updates, construction methods, market conditions, escalation).
- Since Burns & McDonnell has no control over weather, cost and availability of labor, cost and availability of material and equipment, cost of fuel or other utilities, labor productivity, construction contractor's procedures and methods, unavoidable delays, construction contractor's methods of determining prices, economic conditions, government regulations and laws (including the interpretation thereof), competitive bidding or market conditions, and other factors affecting such estimates or projections, cost information reflected in our estimates are opinions based on Burns & McDonnell's experience, qualifications, and judgment as a construction professional.

In order to provide a timely AACE Level 5 cost, the implementation costs for Option 1 are based on the Contract A and Contract D bids[4] received from Watson Well Drilling (December 19, 2023) and Womack & Sons (December 19, 2023) for the same work with updates for escalation and the addition of the recommended items such as housing for mechanical equipment. The order-of-

[4] Accordingly, Burns & McDonnell does not assume any responsibility for the accuracy and completeness of data and/or documents prepared by others (including McManus Engineering), or for defects, omissions, departures from contractual requirements.

magnitude implementation costs for Option 2[5] were developed based on equipment sizes and quantities reflected in Appendix E.

Opinions of probable cost developed for the improvements are based on process, electrical, and structural components of each CIP. Costs include equipment, installation, contractor profit, (escalation where necessary) and contingency.

3.2.1 Capital Improvement Projects

An OPC was developed as part of this Technical Memorandum for Option 1 (Rehabilitation of the Tallulah WTP and New Well #7) and Option 2 (Greenfield WTP and New Well #7) to address the violations relating to the water treatment plant. OPCs were not developed selectively for capital improvement projects that directly address the majority of the open violations, which are at the water treatment plant. Rather, these improvement projects were prioritized due to their significant impact on compliance and the substantial capital investment required. Both Option 1 and Option 2 OPCs assume that the Owner will rehabilitate the finished water ground storage tank and high service pump station as part of the Phase I - Baseline Reliability Improvements and subsequent work would utilize the rehabilitated equipment. In addition to the OPC for each Option, OPCs are also provided for construction of two (2) 318,0000-gal tanks and the rehabilitation of the HSPS that align with the design for plant rehabilitation, and one (1) 500,000-gal tank and a new HSPS which would be part of a greenfield site. The OPCs for Option 1 and Option 2, exclusive of the rehabilitation costs for the finished water storage and high service pump station from Phase 1, are shown in **Error! Reference source not found.**. A further breakdown of OPC elements is provided in **Error! Reference source not found.** and **Error! Reference source not found.**.

Table 7: OPC for Capital Improvements

Capital Improvement Project	Opinion of Probable Cost[6]
Rehabilitate WTP and New Well (Option 1)	$29,820,000
Greenfield WTP and New Well (Option 2)	$24,900,000

The OPC for Option 1 is based upon the 2024 contractors' bids for the WTP rehabilitation and new Well #7, as primarily designed by McManus, with the following revisions, as indicated in Table 8.

[5] Land acquisition costs are not included in Option 2 OPC, as it is recommended that further study is performed to determine if the new WTP could be constructed on the existing WTP site, or if the potential greenfield location is most suitable.

[6] Association for the Advancement of Cost Engineering (AACE) Class 5 (ROM - Rough Order of Magnitude): Accuracy range is very wide, often reported as -50% to +100%.

Table 8: OPC for Option 1: Rehabilitate Existing WTP and New Well #7

Item No.	Description	Opinion of Probable Cost ($)
1	Base Bid[7] (Womack 2023)	17,080,000
2	Distribution Improvements (Womack 2023)	420,000
3	Well #7[8] (Watson 2023)	470,000
4	SUBTOTAL	17,970,000
5	New (2) Solids Contact Clarifiers (in lieu of Rehabilitation)	590,000
6	New Phosphate Feed System	850,000
7	New Cascade Aeration System (with raised concrete platform in lieu of induced-draft style aerators)	320,000
8	Phasing, MOPO, Yard Piping	750,000
9	Electrical System Additional Modifications (Improvements to the existing electrical gear at the WTP, resulting from a recent life safety event)	2,300,000
10	Escalation on Base Scope	700,000
11	Scope Risk (Contractor's risk associated with performing work at the site, based on site conditions)	1,740,000
12	Engineering Re-Design & Engineering Services During Construction (ESDC)	1,800,000
13	Contingency	2,800,000
14	SUBTOTAL	11,850,000
15	TOTAL[7]	29,820,000

The OPC for Option 2, as detailed in Table 9, is based upon the existing WTP remaining in service during construction of the new WTP.

Table 9: OPC for Option 2: Greenfield WTP and New Well #7

Item No.	Description	Opinion of Probable Cost ($)
1	Site Work[5]	850,000
2	Yard Piping	1,080,000
3	Low Service Pump Station (3 pumps)	710,000
4	Plant Drain Pump Station	300,000
5	Cascade Aeration System (2 aerators)	960,000
6	Greensand Filter System (three (3) filters)	3,100,000
8	Solids Contact Clarifier (2, 40' Diameter)	2,000,000
9	Gravity Thickener (1, 20' Diameter)	540,000

[7] Less Bid Item No. 5 (ground storage tank) and No. 6 (high service pump station) as these costs are part of Phase 1 – Baseline Reliability Improvements.

[8] Less Bid Item No. 21 (abandon and cap Well #2, #3, #4) as these costs are part of Phase 1 – Baseline Reliability Improvements.

Item No.	Description	Opinion of Probable Cost ($)
10	Dewatering System (includes building)	1,170,000
11	Sludge Storage Pad	140,000
12	Chemical Feed Systems (Chlorine (includes building), phosphate, sulfuric acid)	1,120,000
13	Lime Feed	780,000
14	Control, Laboratory and Administration Building	1,420,000
15	Electrical	3,800,000
16	Backup Generators (2, 500KW)	560,000
17	Well #7 (Watson 2023)	470,000
18	SUBTOTAL	19,000,000
19	Phase 1 + 2 Engineering Re-Design & ESDC	2,200,000
20	Contingency	3,700,000
21	SUBTOTAL	5,900,000
22	TOTAL[7,9]	24,900,000

3.2.2 Corrective Action Costs

Opinions of probable cost were developed for CAs outside of Option 1 and 2 described above, which address other outstanding violations that would not be corrected under Option 1 or Option 2. The CAs, as detailed in Appendix C, and the associated OPCs and estimated duration to complete each are listed in **Error! Reference source not found.** below.

Table 10: Additional Corrective Actions and Opinions of Probable Cost

Corrective Action Tag	Description	Opinion of Probable Cost ($)	Estimated Duration (months)
CA-1	Phase I – Connection with Regional Wholesale Water Provider[A]	2,500,000[B]	16 to 24
CA-2	Phase I – Structural Repairs to GST	500,000[B]	6 to 9
CA-3	Phase I – Upgrade HSPS	500,000[B]	6 to 9
CA-4	Phase I – Leak Detection and Water Main Repair	150,000[B]	3 to 6
CA-5	Phase I – Advanced Metering Infrastructure	1,500,000[B]	Minimum 24
CA-9	Plug and Abandon Wells #2, #3, and #4	130,000[C]	3 to 6 (Well #3 work can be performed *after* Well #7 installed)

[9] Demolition and/or decommissioning costs are excluded from the estimate.

Corrective Action Tag	Description	Opinion of Probable Cost ($)	Estimated Duration (months)
CA-10	Modifications to Existing Wells #5 and #6 (Assumes Well #3 is plugged and abandoned. This CA is unnecessary if Option 3 is the selected option.)	170,000	3 to 6
CA-11	Payment of Safe Drinking Water Act (SDWA) Administration Fee	27,000[D]	Maximum 1
CA-14	Elevated Storage Tank Miscellaneous Maintenance Items (Miscellaneous NOVs related to e.g., mowing, rehabilitating sample tap, etc.)	40,000	1 to 3
CA-18	City-implemented Corrective Actions (Miscellaneous NOVs related to general WTP items such as PPE, locks on ladders, etc.)	170,000	1 to 3
	TOTAL	5,687,000	-

Notes:

A - Walnut Bayou conducted pressure tests during the week of December 22, 2024, to confirm available pressures for a tie-in with the Tallulah Water System. However, results indicate that existing pressures are insufficient to sustain supplemental flows to Tallulah. Upgrades to Walnut Bayou's infrastructure would be required, with associated costs to be determined before their Board of Directors can approve supplemental flows. While the Phase I cost estimates include the tie-in installation, these conditions must be confirmed and agreed to by the Walnut Bayou Board of Directors.

B – Opinion of Probable Cost developed and provided by Bonton Associates for inclusion in the Technical Memorandum. Burns & McDonnell does not assume liability for completeness or accuracy of Opinions of Cost developed by others.

C – Opinion of Probable Cost is reflective of bid form value provided by Watson Well Drilling (2023) and does not include escalation.

D – Cost indicates most recently available fee amount, dated December 31, 2018.

APPENDIX A – TASK 1: DESKTOP REVIEW

December 5, 2024

Bonton Associates
Charles Caballero
232 3rd St, Suite 100
Baton Rouge, LA, 70801

Re: Task 1 – Desktop Review of Tallulah Water Treatment Plant System

This memorandum summarizes the desktop review conducted for the City of Tallulah's (Tallulah) water treatment plant (WTP). The primary objective of this review was to compile available information to inform recommended corrective actions as part of the future Task 3 Corrective Action Plan (CAP) deliverable.

The review included information from various sources such as grant and loan documents, LDH documentation, previously completed technical reports, raw water sampling reports from Drinking Water Watch, design, and bidding documents for WTP rehabilitation, boil advisories, and other relevant documentation. During the Burns & McDonnell (BMcD) site visit in November 2024, interviews were conducted with representatives from Louisiana Department of Health (LDH), Tallulah City staff, The Wetwork Group, Bonton Associates, and personnel from Tallulah WTP. These interviews focused on the condition of equipment, treatment process units, and areas of outstanding non-compliance with Louisiana Sanitary Code.

Summary of Documents Provided

A description of the documents provided to Bonton Associates and Burns & McDonnell (BMcD is provided below, and a summary catalog of the documents is included in Table 1 below.

Grant Funding Documents

Between the period of 2019 and September 2024, the City of Tallulah applied for loans and grants totaling approximately $15,970,000. The loans and grants are described below. Item No. 3 in Table 1 indicates an additional $7,890,000 in Water Sector Program grant funds may be obtainable if Tallulah is able to use the USDA and ARPA funds as a matching contribution for new funding, though this has not been confirmed.

Drinking Water Revolving Loan Fund (DWRLF): An application for $1,000,000 was submitted on September 12, 2019. No additional information was provided regarding the status of the funding.

USDA Loan and Grant: The City of Tallulah applied for a USDA loan of $4,065,000 and a USDA grant of $3,705,000, both of which were obligated, or legally committed, as of April 9, 2021. The USDA's threshold for unliquidated obligations ranges from 3 to 5 years and the end-date for obligation was not indicated on the documents.

American Rescue Plan Act (ARPA) Funding: Bank statements indicated a balance of $2,200,000 as of September 2024. No additional details on ARPA funding conditions, applications, or grants were available for review.

Water Sector Program Grant: In 2023, email correspondence confirmed the latest agreement between the State of Louisiana and the City of Tallulah. With exception to completion of a rate study, all requirements of the grant have been met. The grant amounts to $5,000,000 for construction and contingencies.

LDH-Provided Documents

Documents provided by LDH include the following: unresolved notices of violation (NOV), administrative orders (AOs), non-compliance with maximum contaminant levels (MCLs), lack of certified WTP operators, Class I sanitary survey results, and deficiencies in disinfectant residual monitoring and record keeping.

Notable observations from the LDH-provided documents are as follows:

- Lack of a certified operator at all times at WTP has been a recurring violation since 2019;
- NOVs dating back to 2011 are extensive and pertain to failing equipment at WTP and issues with the distribution system;
- AOs have been issued dating back to 2017 for reasons such as unresolved or multiple NOVs, boil notices, lack of certified operators; and
- Water quality and compliance issues have been recorded dating back to 2015 for issue such as lead and copper levels, manganese, disinfectant residual, coliform-indicating bacteria, and E. coli.

Other Documents

Other documents provided include a report summarizing major deficiencies of the Tallulah water system, emergency response plans, boil advisories issued to the public by Tallulah, permit application for distribution system project work, a site plan of the WTP, and a cooperative endeavor agreement for state and local fiscal recovery funds.

During the period of 2016 to 2024 the City of Tallulah has issued no less than 29 boil advisory notices. These notices are comprised of:

- Water system outage (seven (7) instances);
- No provided explicit reasoning (eight (8) instances);
- Loss of system pressure (six (6) instances);
- Pump failures (two (2) instances);
- Power failures (two (2) instances);
- Water main breakages (three (3) instances); and
- Apparent measurement of E. coli above acceptable limits (one (1) instance).

Reference Design Documents

Bid documents were provided showing the history of bidders and the bids received from contractors to rehabilitate the WTP to address equipment in poor condition, improvements that would address Louisiana Sanitary Code violation, and groundwater wells. Additionally, a report from 2013 by others was provided to evaluate three (3)

options for addressing the ongoing water treatment system issues: 1) acquire new land in a different part of the aquifer with better water quality, drill new wells, and construct a 29-mile pipeline to Tallulah, 2) acquire wholesale water from Walnut Bayou Water Association and fund necessary capital improvements to their system and water main extension(s), and 3) explore use of unconventional water treatment processes that have been used in other nearby water systems.

Table 1: Catalog of Reference Documents Provided

Item No.	Date (MMM-YY)	File Name	Document Title	Description
American Rescue Plan Act (ARPA) / Grant Funding Documents				
1	Aug-23	Email Correspondences_Tallulah_2023	External Rate Study Certification Request - City of Tallulah	Satisfaction of Grant Conditions
2	Feb-23	Award & Grant Conditions Letter_Tallulah_022223	Authorization of Incur Costs and Grant Agreement with Conditional Transmittal Water Sector Program	Award & Grant Conditions
3	Apr-22	Grant Documents_Tallulah_031824	Rehabilitation of the Water Treatment Plant	USDA Grant Documents
4	Sep-21	ARPA Bank Statements_Tallulah_Sept 2021 to Sept 2024	ARPA Bank Statements	ARPA Bank Statements
5	Sep-18	Water Production & Treatment Grant Funding_Tallulah_092718	City of Tallulah Water Production & Treatment	USDA Grant Funding Documents 2018
6	Oct-16	DWRLF Loan Application_Tallulah_091219	DWRLF Loan Application	Project Costs and Annual Capital Outlay Plan
LDH-Provided Documents				
7	Jun-24	Tallulah_LDH_Site Visit 6-4-24	Tallulah Water System	LDH Site Visit Report Detailing Condition of the Major Infrastructure Issues
8	Feb-24	LDH Letters_Tallulah_2024	LDEQ and Walnut Bayou Water Association	Correspondence on Plant Lime Discharge, Purchasing Water from Walnut Bayou Water Association, and Civil Complaints Against the Tallulah WTP
9	Dec-23	LDH Letters_Tallulah_2023	Tallulah Water Plant Rehabilitation Project	US Senator and Representatives Meeting Summary for the Rehabilitation and Employment of Certified Operators
10	Nov-23	LA1065003_11282023_70212720000127125801	Class I Sanitary Survey	Notice of Violations Pertaining to the WTP Equipment and Distribution System
11	Jan-23	Letter Grade Documentation_Tallulah_2023	Tallulah Water System	LDH Correspondence on Administrative Orders and Extension Requests for 2023 and Water Rate Increases

Item No.	Date (MMM-YY)	File Name	Document Title	Description
12	Dec-22	LDH Letters_Tallulah_2022	Class I Sanitary Survey – Extension Request	Approval/Denial of Requested Extensions for violations since Nov 2018
13	Nov-21	LA1065003_10252021_70202450 000085693379	Class I Sanitary Survey	Notice of Violations Pertaining to the WTP Equipment and Distribution System
14	Nov-21	Tallulah WS LA1065003 - Colorimeter NOV 11.10.2021_7020 2450 0000 8569 3386	Disinfectant Residual Monitoring and Record Keeping	Notice of Violation of Colorimeter Operation to Measure Chlorine Residuals
15	Jan-21	LDH Letters_Tallulah_2021	Level 1 Water Assessment	Forms and Correspondence for Compliance with Levels of Coliform, E. Coli, and Disinfectant Residual
16	Oct-20	Lead & Copper Sample Results_Tallulah_102720	Notice of Lead and Copper Sample Results	Sample Results for Lead and Copper in exceedance of the MCL
17	Jul-20	LDH Letters_Tallulah_2020	Warning Letter	Operation Evaluation Level Report to Determine Compliance with the Louisiana Environmental Quality Act and Supporting Regulations
18	Feb-20	Administrative Ordinance_Tallulah_031120	Administrative Order	LDH Correspondence Regarding Alum Pump, Plant Capacity, and Employment of WTP Operators
19	Aug-19	Investigation Report_Tallulah_081519	Post-Order Investigation Report	Post-Order Investigation Report Including Civil Penalties and Lack of Certified Operators
20	Jul-19	Tallulah_WS.1065003.AO_No._C-19-065-020-REQ.07-10-2019	Administrative Order	Civil Penalty and Administrative Order Summary for Lack of Certified Operators and Issuance of Boil Notices
21	Jun-19	LDH Letters_Tallulah_2019	Master Plan, Water System Improvements	Rural Development Inquiries for the Development of a new Water Treatment Plant
22	May-19	Tallulah NOV Operator Certification 5-22-19	Notice of Violation: Operator Certification	Notice of Violation for Lack of Operators on Duty During WTP Hours of Operation
23	Mar-19	Administrative Ordinance_Tallulah_071019	Administrative Order	Civil Penalty and Administrative Order Summary for Lack of Certified Operators and Issuance of Boil Notices
24	Dec-18	Administrative Ordinance_Tallulah_121818	Administrative Order	Summary of Violations from an LDH Site Visit Conducted in Dec-2018
25	Dec-18	TALLULAH_WATER_SYSTEM_SV_ 11272018 2	Enforcement Survey	LDH Violation Summary for a Routine Sanitary Survey

Item No.	Date (MMM-YY)	File Name	Document Title	Description
26	Apr-18	LDH Letters_Tallulah_2018	Capacity Development Assessment of: Tallulah Water System, LA1065003	Review of Managerial, Technical, and Financial Capacity of the Water System
27	Nov-17	Tallulah LDH Open Violations	Open Violations (LDH)	Open violations for Groundwater Rule, Lead and Copper Rule and, Revised Total Coliform Rule
28	Oct-17	LDH Letters_Tallulah_2017	Sanitary Survey – Extension	List of violations and Extensions Granted for WTP Equipment Violations
29	Mar-17	LDH Level 2 Assesment_Tallulah_101821	Level 2 Assessment	Level 2 Assessment Forms and Results with Corrective Actions for Out of Compliance Equipment
30	Jul-16	LDH Letters_Tallulah_2016	Notice of Violation/ Public Notification of Non-Compliance	Letters to the Public for Non-Compliance and MCL Violations
31	Dec-15	LDH Letters_Tallulah_2015	Class I Sanitary Survey	Class I Sanitary Survey Results for out of compliance WTP Equipment and MCLs for Copper and Lead
32	May-11	Tallulah WS LA1065003 R.S. 40 1281.12 Requirements 5.11.2022_7020 2450 0000 8569 4123	R.S. 40:1281.12 Requirements	Notice of Violation for Lack of a Required Distribution Flushing Program
Other Documents				
33	May-24	Tallulah 05.21.24 Report	Sustainability as Service Access to WTP	Notification and Report of Major System Components and Deficiencies
34	Dec-23	WTP Emergency Response Plan_Tallulah_Dec 2023	Emergency Response Plan	Emergency Response Plan for Tallulah Water Plant
35	Sep-23	Authorization to Bid_Tallulah_091523	Transmission of Water Sector Program Contract and Permission to Bid	Authorization to Bid on a New Water Well, Painting of the Elevated Tank, and Rehab of the Existing WTP
36	Sep-23	DOTD Utility Permit Application_Tallulah_091423_Working	Utility Permit	Utility Permit Forms to Install Gate Valves in the Distribution System
37	Apr-23	Cooperative Endeavor Agreement_Tallulah_040323_Executed_050523	Cooperative Endeavor Agreement	Cooperative Endeavor Agreement for the Use of Coronavirus State and Local Fiscal Recovery Funds
38	Mar-21	Boil Advisory_Tallulah_2021 to Present	Boil Advisories	Boil Advisories 2021 to Present Press Releases ; Due to Loss of System Pressure, Failure of the Emergency Diesel Pump, Breaker Failure, Low Service Pump Failure, and Water Shortage
39	Oct-20	Boil Advisory_Tallulah_2020	Boil Advisories	Boil Advisories 2020 Press Releases ; Due to a

Item No.	Date (MMM-YY)	File Name	Document Title	Description
				Communication Malfunction Between the High Service Pump and Elevated Tank, Major Water Leaks in the Distribution System, and Problems with the Low Service Pumps Resulting in Loss of System Pressure
40	Sep-19	Boil Advisory_Tallulah_2019	Boil Advisories	Boil Advisories 2019 Press Releases ; Due to a Pump Failure
41	Mar-18	Boil Advisory_Tallulah_2018	Boil Advisories	Boil Advisories 2018 Press Releases ; Due to Breakdown of Two WTP Pumps, Control Panel Damage, and Loss of WTP Power
42	Jun-17	Boil Advisory_Tallulah_2014 to 2017	Boil Advisories	Boil Advisories 2014 - 2017 Press Releases ; Due to Loss of Pressure and Questionable Microbiological Quality
43	Feb-91	Tallulah WTP Site Plan	Tallulah WTP Site Plan	Tallulah WTP Site Plan
Reference Design Documents				
44	Jan-24	Bid Rejection Letter Due to Insuff. Funds_Contract D (WTP Rehab)_Womack & Sons_011224	Well Bid Rejection	Tallulah City Council Well Bid Rejection Due to Insufficient Funds being Available
45	Aug-23	Request to Bid_Tallulah_083023	Request to Bid	Agreement between the State of Louisiana and the City of Tallulah on Conditions to be Met to Receive Permission to Bid and Construct the Rehabilitation Project for the WTP
46	Dec-23	Bid Tabulation_Contract A (New Water Well)_Watson Well Drilling_121923	Well Bid	Breakdown of Watson Well Drilling and Construction Well Drilling Estimate
47	Dec-23	Bid Tabulation_Contract D (WTP Rehab)_Womack & Sons_121923	Well Bid	List of Contract Bidders for the Drilling of a New Water Well
48	Aug-22	LDH Plans and Specs Approval_Tallulah_081522	Water Permit No. P-22-08-065-104	Contract D – Rehabilitation of the Existing Water Treatment Plant Permit Issuance
49	Oct-21	663E CONTRACT A 09-30-21	Contract A – A New Water Well (McManus Engineering)	McManus Engineering design drawings of a new groundwater well
50	Oct-21	Tallulah- Cont. A- New Water Well (18-04-663E)	Contract A – A New Water Well (Well No. 7)	McManus Specifications and Contract Documents for Instillation of a New Water Well
51	Sep-21	663E TALLULAH WTP REHAB 09-30-21	Rehabilitation of Water Treatment Plant (McManus Engineering)	McManus Engineering design drawings for WTP rehabilitation

Item No.	Date (MMM-YY)	File Name	Document Title	Description
52	Sep-21	Tallulah- Cont. D- Rehab. W.T.P. (18-04-663E)	Contract D – Rehabilitation of WTP	McManus Specifications and Contract Documents for Rehabilitation of the Existing Tallulah WTP
53	Aug-19	Cost Estimate Option# 3_Tallulah_081919	Refurbish Existing Water Treatment Plant	McManus Costing Details for Refurbish of WTP
54	Feb-18	MSA_Tallulah_McManus_021218_ Executed	Agreement for Professional Services	Contract Agreement between Tallulah and McManus Consulting Engineers, INC.
55	2013	Water System Improvement Report_Tallulah	City of Tallulah Water System Improvements	Bryant Hammett & Associates, LLC Executive Summary and Findings Report for Three WTP Options to Prevent Arsenic Levels Above the MCL

Raw Water Quality Data

A summary of the raw water quality data obtained from the Drinking Water Watch website is shown below in Table 2. Generally, the raw water quality for Tallulah contains high levels of aluminum, arsenic, iron, manganese, alkalinity, and hardness. The raw water pH ranges between slightly acidic and slightly basic. The constituents of arsenic, iron, and manganese all exert an oxidant demand on the water (i.e., require an oxidant to change the oxidation state for improved removal), and the water treatment plant has faced challenges with removal of said constituents. The Tallulah system introduces oxidation via aerators and by adding free chlorine for disinfection. Removal of these parameters at locations through the WTP is undocumented and is a goal of the sampling plan for the CAP.

Examination of the stoichiometric demand of oxygen and chlorine to fully oxidize the parameters is as follows.

- Arsenic (0.019 mg/L from Well 6)
  - Oxygen: N/A, not readily oxidized to As(V) particulate
  - Chlorine: 0.28 mg/L required
- Iron (12.0 mg/L from Well 6)
  - Oxygen: 1.68 mg/L required
  - Chlorine: 7.68 mg/L required
- Manganese (1.7 mg/L from Well 6)
  - Oxygen: 0.49 mg/L required
  - Chlorine: 2.19 mg/L required

Table 2: Tallulah Raw Water Quality (Source: Drinking Water Watch)

Location		Aluminum (mg/L)	Arsenic (mg/L)	Iron (mg/L)	Manganese (mg/L)	Total Alkalinity (mg/L as CaCO3)	Total Hardness (mg/L as CaCO3)	pH (s.u.)
	MCL SMCL	0.05 to 0.2	0.01	0.3	0.05	N/A	N/A	6.5 to 8.5
Well 2	Minimum	0.01	0.003	12.1	1.1	480	216	6.83
	Average	0.03	0.005	13.9	1.2	480	253	6.83
	Maximum	0.05	0.006	16.3	1.3	480	290	6.83
Well 3	Minimum	0.04	0.004	11.7	0.9	415	253	6.88
	Average	0.04	0.004	12.3	1.0	415	253	6.88
	Maximum	0.04	0.004	13.0	1.1	415	253	6.88
Well 4	Minimum	0.03	0.002	4.1	1.3	367	218	7.55
	Average	0.03	0.002	9.1	1.5	367	218	7.55
	Maximum	0.03	0.002	14.0	1.7	367	218	7.55
Well 5	Minimum	0.04	0.005	11.0	1.3	398	230	7.77
	Average	0.04	0.005	11.0	1.3	398	230	7.77
	Maximum	0.04	0.005	11.0	1.3	398	230	7.77
Well 6	Minimum	0.02	0.013	11.7	1.7	232	227	6.29
	Average	0.13	0.019	12.0	1.7	380	244	7.17
	Maximum	0.23	0.025	12.8	1.8	479	275	8.11

Interviews

Also included in the overview of the Tallulah system, interviews with the following individuals were conducted by BMcD in a group setting during the site walk through at the WTP in November 2024.

Persons Interviewed During Burns & McDonnell's Site Visit in November 2024

a. LDH
   i. Barbara Featherston, P.E. (District IV Engineer, LDH/OPH Engineering Services)
   ii. Tyler Lollis , P.E. (Regional Engineer, LDH/OPH Engineering Services)
b. City of Tallulah, LA
   i. Pamela Grady (City Attorney)
   ii. Yvonne Lewis (Administrative Assistant, City of Tallulah)
   iii. Charles Finlayson (Mayor, City of Tallulah)
c. Tallulah WTP
   i. Jailynn Puckett (WTP staff)
   ii. Andre Cooper (WTP staff)
d. Bonton Associates
   i. Charles Caballero, P.E. (Project Manager)
   ii. Michael Ellis, P.E. (Project Manager)

e. The WetWork Group
    i. Sean Benton (Independent Contract Operator)
    ii. Daren Johnson (Independent Contract Operator)

A summary of the site visit is fully detailed in the Task 2 Deliverable: Field Assessment Summary Report (November 15, 2024). Following is brief overview of the interview details:

Information on Plant Asset Conditions and Status Obtained from Interviews

- Groundwater Wells
    - The current production capacity of the groundwater wells is unknown (Plant Staff).
    - Groundwater Well 2 is not currently used for drinking water production, but instead is used for filling fire trucks to clean out the solids contact clarifiers (Plant Staff).
    - Groundwater Well 4 is not operating and has been out of service for an unknown duration. It is unknown if the well is offline for water quality or mechanical issues (Plant Staff).
- Aerators
    - The two (2) aerators are believed to be rated for a hydraulic capacity of 500 gpm each (LDH).
- Solids Contact Clarifiers
    - The two (2) solids contact clarifiers at Tallulah WTP must remain in service at all times due to demands of the City's water system (Plant staff).
    - Lime dosing is adjusted based on the effluent pH from the clarifiers, with a target effluent pH of 10.2 (Plant staff).
    - The shaft of the mixer at Clarifier 2 is broken but this was not visually confirmed during the visit (Plant staff).
    - The mechanical components for sludge blowdown maintenance (i.e., valves, etc.) are reportedly not functioning or their whereabouts are unknown. Current sludge blanket cleanout procedure involves draining the clarifier(s) through the 8" drain nozzle on the side of the clarifier until the water level is at the sludge blanket while simultaneously agitating the sludge blanket with a fire hose until the sludge blanket level is at the drain nozzle (Plant staff).
- Intermediate Clearwells
    - Sludge carryover is present in the pressure filters from the intermediate clearwells and clarifiers (Plant staff).
    - A local welder advised not to make repairs to the steel, as any attempted repair welds would likely further damage the steel plates (Plant staff).
- Low Service Pump Station
    - LSP 2 has been out of service for over six (6) months and the emergency diesel-powered backup pump has been in continuous operation over that time (Plant staff).
    - The internal pump components have experienced damage from lime solids carry over (Plant staff).
- Pressure Filters
    - Pressure filters 1 and 2 cannot be taken offline for maintenance due to the demand of the water system (Plant staff).

    - The filter media contents consist of gravel at the bottom, followed by sand, with no apparent anthracite or granular activated carbon (GAC) above the sand. Plant staff also reported a significant amount of lime sludge is present above the media (Plant staff).
    - A welder inspected the filters and indicated the steel plating is so thin that repair welds cannot be performed without risking further damage to the filter (City staff).
- Final On-site Clearwell
    - The Final Clearwell has a sunken, or low spot, on the roof of the tank which accumulates standing water (LDH).
- Elevated Storage Tank
    - The elevated tank was not observed to provide any supplemental storage or pressure to the system during the site visits; reportedly caused by High Service Pump (HSP) 2 being out of service, which is the only pump with enough discharge pressure to fill the elevated tank (Plant staff).
- High Service Pump Station
    - A valve on the exterior of the HSP Station feeding the elevated tank is reportedly seized half-open and cannot be manually actuated, which is contributing to the system's low pressure issue (Plant staff).
    - The pumps are rebuilt every six (6) months (Plant staff).
    - Past pump repairs and rebuilds indicated lime sludge carry-over into the pumps which was wearing out mechanical components and causing calcium deposit buildup (Plant staff).
    - There may also be issues with the pressure relief valves, but this was not visually confirmed (Plant staff).
    - One (1) additional natural gas-powered backup pump is present in the HSP station, although it is not functional and has been out of service for several years (Plant staff).
- Chemical Feed Systems
    - The lime system is typically operated at maximum feed rate and the carrier water flow rate is not controlled (Plant staff).
    - The alum transfer pump is functioning and the metering pumps showed signs of functionality, although this was not confirmed in the field due to apparent lack of alum available (Plant staff).
    - The chlorine residual is not measured anywhere at the plant, and the chlorine demand is unknown (Plant staff).
    - A finished water sample point is not identified for chlorine residual measurement (Plant staff).
    - The carbon dioxide dose is adjusted based on the available stock in the bulk storage tank, turning it down when low and back up when replenished (Plant staff).

Summary of Missing Information

The following are missing documents or documentation that would be helpful in evaluating future corrective action plans for Tallulah WTP.

- NPDES Permit for discharges from WTP. Currently discharges are being directed to the unnamed creek passing through the site.
- Nameplates indicating capacity and rating for:

    - Groundwater well pumps, aerators, solids contact clarifiers, low service pumps, pressure filters, high service pumps, lime storage and feed, ground storage tank, carbon dioxide feed equipment, chlorine feed equipment, and alum pumps
- Operations and Maintenance (O&M) Manuals and Standard Operating Procedures (SOPs) associated with:
    - Aerators, solids contact clarifiers, blowdown/removing sludge from clarifiers, low service pumps, pressure filters, filter backwashing, high service pumps, sampling, and laboratory procedures (i.e., chlorine residual, titration for alkalinity and hardness measurements, pH probe calibration, iron measurements, arsenic measurements, and manganese measurements)
    - Raw and finished water quality data
        - Total organic carbon (TOC) concentration data
        - Turbidity
        - Calcium hardness
        - Iron (dissolved)
        - Manganese (dissolved)
        - Chlorine residual
    - Flow rate of water entering and exiting the WTP
    - Monthly operating logs
        - Raw water quality and flowrate
        - Finished water quality and flowrate
        - Water quality parameters throughout the plant
    - CT calculations
- Sample Locations at WTP and Distribution System
    - Active sample locations in use by the City
    - Plan and frequency of sampling
    - Records of past sampling

Sampling Plan for Tallulah WTP

A range of sampling results is useful to further develop an informed corrective action. The following table summarizes the recommended sampling analytes and locations:

Table 3: Proposed Sampling Analytes and Locations

Sample Location	Frequency and Duration	Analyte(s)
Raw water (Discharge from each well)	Daily, for one week	1. pH 2. Alkalinity (total) 3. Hardness (total and calcium) 4. Iron (total and dissolved) 5. Manganese (total and dissolved) 6. Arsenic
	One time	1. TOC 2. Ammonia
Aerator effluent	Daily, for one week	1. pH 2. Alkalinity (total) 3. Iron (total and dissolved) 4. Manganese (total and dissolved) 5. Arsenic
Clarifier effluent	Daily, for one week	1. Turbidity 2. pH 3. Alkalinity (total) 4. Hardness (total and calcium) 5. Iron (total and dissolved) 6. Manganese (total and dissolved) 7. Arsenic
	One time	1. TOC
Filter influent	Daily, for one week	1. pH 2. Iron (total and dissolved) 3. Manganese (total and dissolved) 4. Chlorine residual
Filter effluent	Daily, for one week	1. Turbidity 2. pH 3. Alkalinity (total) 4. Hardness (total and calcium) 5. Iron (total and dissolved) 6. Manganese (total and dissolved) 7. Arsenic 8. Chlorine residual
	One time	1. TOC
Finished water	Daily, for one week	1. Turbidity 2. pH 3. Alkalinity (total) 4. Hardness (total and calcium) 5. Iron (total and dissolved) 6. Manganese (total and dissolved) 7. Arsenic 8. Chlorine residual
	One time	1. TOC
Distribution system	Daily, for one week	1. Turbidity 2. pH 3. Alkalinity (total)

Sample Location	Frequency and Duration	Analyte(s)
		4. Hardness (total and calcium) 5. Iron (total and dissolved) 6. Manganese (total and dissolved) 7. Arsenic 8. Chlorine residual
	One time	1. TOC
Clarifier Blowdown & Filter Backwash	Daily, during discharge events, for one week	2. pH 3. Chlorine residual 4. TDS 5. Arsenic 6. Iron (total) 7. Manganese (total)

Tallulah LDH Violations

An overview of LDH violations is shown in Table 4, in the following pages. The table summarizes WTP equipment, including: aeration systems, elevated storage tanks, and generators; ground storage tanks, pumps, intermediate clearwells, and pressure filters. Also summarized in the table are violations related to water wells, administration fees, chemical equipment, and distribution system.

Summary

The Desktop Review provided an overview of the Tallulah WTP and system deficiencies over the past several years, with limited background as to when the deficiencies began to arise over the past decade. The largest gaps in information relate to operations and maintenance of both the WTP and distribution system and water quality data throughout the WTP. Further, detailed documentation on City decisions and/or directives related to the deficiencies was not found. Results of the sampling plan (as available), coupled with the details from the Task 2 Field Assessment Summary Report will inform the recommendations for a corrective action plan for Tallulah WTP and system.

Sincerely,

Burns & McDonnell Engineering Company, Inc.

Trevin Heisey, PE, Assoc. DBIA
Senior Process Engineer

Tara Delagarza, PE, PMP, Assoc. DBIA
Project Manager

cc: Madison Taylor

Table 4: Tallulah LDH Violations

Item No.	Documentation Date Start	Facility / Unit Name	Observation and Corrective Action	Code Citation
Administration				
1	1/1/2017	Administration Fees	System has not remitted payment of the Safe Drinking Water Administrative Fee for the April 1, 2018 through June 30, 2018 and July 1,2018 through September 30, 2018 compliance periods in the amount of $17,487.60. After December 31,2018, the Safe Drinking Water Administrative Fees will total $26,231.40.	LSA-R.S. 40:31:33A
Aerator				
2	11/9/2021	Aerator	The aerator closest to the filter gallery was leaking heavily at the time of inspection. Filter #2 was leaking and rusting from the access ports on the western end. The leaks and rust must be repaired; interruption of service to customers should be minimized.	LAC 51:XII.319.D.25 - All potable water systems shall be designed, constructed, and maintained so as to prevent leakage of water due to defective materials, improper jointing, corrosion, settling, impacts, freezing, or other causes. Valves and blow-offs shall be provided so that necessary repairs can be made with a minimum interruption of service.
Chemical / Chemistry				
3	1/1/2017	Lime and Alum Dosing room	A cover is not provided on the slaking box and lime is spilling into the treatment plant	LSA-R.S. 40:4, LAC 48:V.7707 and LAC 51:XII.319.D.21
4	1/1/2017	Chemical	The Aluminum Sulfate pump is leaking at the tanks	LSA-R.S. 40:4, LAC 48:V.7707 and LAC 51:XII.319.D.21
5	6/23/2017	Chemical	There was no respiratory equipment or suits for the operator to use in the lime room. At least one pair of rubber gloves, a dust respirator of a type certified by NIOSH for toxic dusts. An apron or other protective clothing and goggles or face mask shall be provided for each operator as required by the reviewing authority. A deluge shower and eye-washing device should be installed where strong acids and alkalis are used or stored.	
6	11/27/2018	Chemistry	At the time of the inspection, it was noted the colorimeters being used to measure the chlorine residuals in the systems were not being checked against known color standards to verify the colorimeters are operating properly. Color standards must be purchased that are specified by the manufacturer of the colorimeter and used weekly to test the colorimeters and this information is to be recorded. Colorimeter that fail the tests must either be repaired by the manufacturer or replaced with one meeting EPA requirements.	LAC 51:XII.367.F - Chlorine residuals shall be measured in accordance with the analytical methods set forth in Section 1105.C of this Part.
7	11/9/2021	Chemical	The alum bulk storage tanks were not provided with secondary containment. Provide the required receiving basin.	LAC 51:XII.I.203.I.4.b - Liquid chemical storage tanks shall have an overflow and a receiving basin capable of receiving accidental spills or overflows without uncontrolled discharge; a common receiving basin may be provided for each group of compatible chemicals, which provides sufficient containment volume to prevent accidental discharge in the event of failure of the largest tank.

Item No.	Documentation Date Start	Facility / Unit Name	Observation and Corrective Action	Code Citation
8	11/9/2021	Chemical	Chlorine cylinders in the chlorine room and stored outdoors were not properly restrained. Restrain all cylinders to an immovable object (e.g., a wall) with their own chain at a height of about two-thirds their height from the bottom to prevent falling. A single chain restraining multiple cylinders is not sufficient nor safe. Chlorine cylinders stored outdoors were exposed to direct sunlight. Protect chlorine cylinders from direct sunlight and windblown debris.	LAC 51:XII.209.A.7.c - Full and empty cylinders of chlorine gas shall meet the following requirements: restrained in position. LAC 51:XII.209.A.4.a - Chlorine gas not stored in a room shall be protected from direct sunlight and windblown debris.
Clarifiers				
9	1/1/2017	Clarifier #1	The ball valve for Clarifier #1 is broken	LSA-R.S. 40:4, LAC 48:V.7707 and LAC 51:XII.319.D.21
10	1/1/2017	Clarifier #1	The flash mixer for Clarifier #1 is not working	LSA-R.S. 40:4, LAC 48:V.7707 and LAC 51:XII.319.D.21
11	1/1/2017	Clarifier #1	The scraper drive at Clarifier #1 was not working properly	LSA-R.S. 40:4, LAC 48:V.7707 and LAC 51:XII.319.D.21
12	1/1/2017	Clarifier #1 & #2	The weirs of Clarifier #1 and Clarifier #2 need cleaning	LSA-R.S. 40:4, LAC 48:V.7707 and LAC 51:XII.319.D.21
Distribution System				
13	6/23/2017	Distribution System	The water system cannot take any water plant facilities out of service for maintenance or repair because of the demand within the distribution system. From information received at the sanitary survey, the production from the water plant is just barely keeping up with the usage from customers, water loss, leaks, etc. The distribution system must be evaluated for leaks and repaired such that water plant facilities may be properly maintained. The water system was not able to valve off the system when a 6" water main was cut near the water treatment plant. The water main break resulted in the Town of Tallulah being out of water. A sufficient number of valves shall be provided on water mains to minimize inconvenience and sanitary hazards during repairs. Valves should be located at not more than 500 foot intervals in commercial districts and at not more than one block or 800 foot intervals in other districts. Where systems serve widely scattered customers and where future development is not expected, the valve spacing should not exceed one mile.	LAC 51:XII.319.D.25 - All potable water systems shall be designed, constructed, and maintained so as to prevent leakage of water due to defective materials, improper jointing, corrosion, settling, impacts, freezing, or other causes. Valves and blow-offs shall be provided so that necessary repairs can be made with a minimum interruption of service.
14	6/1/2018	Distribution System	CR -Inadequate Min Chlorine Residual (GW&SW) Minimum Disinfection Residuals in Distribution System	40 CFR 141.403 and LAC 51:XII.357.A - Disinfection equipment shall be operated to maintain disinfectant residuals in each finished water storage tank and at all points throughout the distribution system at all times in accordance with the following minimum levels. 1. a free chlorine residual of 0.5 mg/l, or, 2. a chloramine residual (measured as total chlorine) of 0.5 mg/l for those systems that feed ammonia.

Item No.	Documentation Date Start	Facility / Unit Name	Observation and Corrective Action	Code Citation
15	11/27/2018	Distribution System	As there is presently no way for the water system to shut off service to make major repairs without the loss of water service to the customers of the city, the City of Tallulah must work out an agreement with the neighboring water system to obtain an emergency source of water in the case of an emergency.	
16	12/3/2020	Distribution System	CT -5% DS Below Min 0.5-2 Months Consec (GW)	
17	1/1/2021	Distribution System	Follow-up or Routine Tap M/R (LCR)	Lead and Copper Rule
18	8/31/2022	Distribution System	Coliform levels out of compliance	Revised Total Coliform Rule (RTCR)
19	10/1/2023	Distribution System (MCL)	Manganese Sample Result: 0.45 MG/L MCL: 0.3 MG/L	
20	11/28/2023	Distribution System	The Tallulah Water System has numerous leaks throughout the distribution system. The leaks must be repaired.	LAC 51:XII.319.D.25 - All potable water systems shall be designed, constructed, and maintained so as to prevent leakage of water due to defective materials, improper jointing, corrosion, settling, impacts, freezing, or other causes. Valves and blow-offs shall be provided so that necessary repairs can be made with a minimum interruption of service.
21	11/28/2023	Monitoring Violation / Distribution System	The system is not completing the “Monthly Chlorine Residual at Additional Chlorine Residual Sites” report form. Official notice of this violation, along with any required actions that must be taken, will be provided under separate cover.	LAC 51:XII.367.B. - Disinfectant Residual Monitoring in Distribution System. A public water system shall measure the residual disinfectant concentration within the distribution system: 1. by sampling at the same points in the distribution system and at the same times that samples for total coliforms are required to be collected by the public water system under this Part. 2. by sampling at an additional number of sites calculated by multiplying 0.25 times the number of total coliform samples the public water system is required under this Part to take on a monthly or quarterly basis, rounding any mixed (fractional) number product up to the next whole number. These additional residual monitoring samples shall be taken from sites in low flow areas and extremities in the distribution system at regular time intervals throughout the applicable monthly or quarterly sampling period. and 3. by sampling at the site that represents the maximum residence time (MRT) in the distribution system at least once per day.
22	10/4/2024	Distribution System	Level 1 Assess, Multiple TC POS (RTCR)	Lead and Copper Rule
Elevated Tank				

Item No.	Documentation Date Start	Facility / Unit Name	Observation and Corrective Action	Code Citation
23	11/9/2021	Elevated Tank	Erosion was occurring underneath the center riser column of the elevated tank. The erosion under the concrete support raised questions of the structural integrity of the tank. The cause of the erosion must be investigated and repaired, and the ground must be graded such that the center column is properly supported.	LAC 51:XII.319.D.24 - System shall ensure that no critical water system component is in poor condition or defective.
24	11/9/2021	Elevated Tank	The fence surrounding the elevated tank is overgrown with vegetation in several places. The vegetation must be removed as it can compromise the functionality and protection provided by the fencing.	LAC 51:XII.319.D.9 and 315.A - All public water supply wells, treatment units, tanks, etc., shall be located inside a fenced area that is capable of being locked; said areas shall be locked when unattended. The fence shall be resistant to climbing and at least 6 feet high.
25	11/28/2023	Elevated Tank	The screen on the elevated tank overflow was broken at the time of inspection. Provide the overflow with a four mesh non-corrodible screen.	LAC 51:XII.319.D.14 and 337.C - Any vent, overflow, or water level control gauge provided on tanks or other structures containing water for any potable water supply shall be constructed so as to prevent the entrance of birds, insects, dust, or other contaminating material. Openings or vents shall face downward and shall be not less than 2 feet above the floor of a pump room, the roof or cover of a tank, the ground surface, or the surface of other water supply structures.
26	11/28/2023	Elevated Tank	The sample tap for the elevated storage tank has threads and is connected to a hose. Remove the hose and threads to provide a compliant sample tap.	Analysis: 1. shall be of the smooth-nosed type without interior or exterior threads; 2. shall not be of the mixing type; and 3. shall not have a screen, aerator, or other such appurtenance.
27	11/28/2023	Elevated Tank	The pressure gauge for the elevated storage tank is broken. Repair or replace the pressure gauge.	LAC 51:XII.231.D - Adequate controls shall be provided to maintain levels in distribution system storage structures. Level indicating devices should be provided at a central location.
Generator / Backup Power				
28	11/27/2018	Generator / Backup Power	At the time of the inspection, it was noted the existing generator is operational, however it currently does not supply power to operate the plant, and it is unknown at this time if it is of large enough size (KW) to produce the power needed to operate the plant in an emergency. Presently the system needs a load test to evaluate if the existing generator is of sufficient size to run all the components in the plant (lime feeders, low & high service pumps, all control panels, sludge pumps as well as well #5 (provided that wells 3 & 4 are being operated by the existing natural gas engines) and lighting to be able to supply the town's water needs during an emergency. In addition to the main generator, there are 3 natural gas operated engines that must be in operation for the water system to be able to supply water in the case of an emergency. The engine and PTO at well 3 is operational, however, the PTO lacks a safety shielding to prevent harm to employees working around it. Well 4 has a natural gas powered engine, but during the last evaluation of the well by a licensed well driller, the PTO shaft was removed by the well drillers work crew and never replaced and its whereabouts is unknown. It was also noted that the natural gas powered engine that operates the low service emergency pump #3 is functional, however the pump itself is broken. The main generator must be able to run all components necessary to operate the plant as listed above with the assistance of the auxiliary generators, PTOs and pumps must be operational and be able supply water to the town during a crisis to ensure continuous service when the primary power has been interrupted, Dedicated standby power shall be provided by any community water supply and any non-community water supply serving a hospital so that water may be treated and/or pumped to the distribution system during outages to meet the average daily demand during the month of maximum water use.	
Ground Storage Tank at Plant				

Item No.	Documentation Date Start	Facility / Unit Name	Observation and Corrective Action	Code Citation
29	11/27/2018	Ground Tank at Plant	The access ladders to the top of the dark blue ground storage tanks were not locked at the time of the inspections. The ladders shall be locked whenever plant personnel are not present at the plant site in order to prevent trespassing, vandalism, and sabotage.	
30	10/25/2021	Ground Tank at Plant	The two drain valves on the ground storage tank were cracked and appeared to be leaking at the time of inspection. The leaks must be repaired by replacing the valves; interruption of service to customers should be minimized.	LAC 51:XII.319.D.25 - All potable water systems shall be designed, constructed, and maintained so as to prevent leakage of water due to defective materials, improper jointing, corrosion, settling, impacts, freezing, or other causes. Valves and blow-offs shall be provided so that necessary repairs can be made with a minimum interruption of service.
31	10/25/2021	Ground Tank at Plant	Portions of the fence surrounding the rear of the water plant were missing, and the existing fencing was overgrown with vegetation in several areas. A continuous, lockable security fence must be provided around the facility for protection against unauthorized access, and the vegetation shall be removed as it can compromise the functionality and protection provided by the fencing.	LAC 51:XII.319.D.9 and 315.A - All public water supply wells, treatment units, tanks, etc., shall be located inside a fenced area that is capable of being locked; said areas shall be locked when unattended. The fence shall be resistant to climbing and at least 6 feet high.
32	10/25/2021	Ground Tank at Plant	The painted exterior of the tank appeared to be in poor condition. Tanks shall be painted and/or provided cathodic protection to prevent rust and corrosion.	LAC 51:XII.225.S - Painting and/or cathodic protection. Proper protection shall be given to metal surfaces by paints or other protective coatings, by cathodic protective devices, or by both.
33	11/9/2021	Ground Tank at Plant	Several thick tree roots appeared to have grown into the rear bottom of the tank on top of the slab. Have the tank evaluated by a registered professional engineer familiar with applicable ASME tank standards. Submit findings to this office. If repairs, modifications, replacement, etc. are required, submit plans and specifications to this office for review and permit.	LAC 51:XII.319.D.24 - System shall ensure that no critical water system component is in poor condition or defective.
34	11/28/2023	Ground Tank at Plant	The screen on the ground storage tank overflow is torn. Provide a compliant vent covered with twenty-four mesh non-corrodible screen.	LAC 51:XII.319.D.14 and 337.C - Any vent, overflow, or water level control gauge provided on tanks or other structures containing water for any potable water supply shall be constructed so as to prevent the entrance of birds, insects, dust, or other contaminating material. Openings or vents shall face downward and shall be not less than 2 feet above the floor of a pump room, the roof or cover of a tank, the ground surface, or the surface of other water supply structures.
35	11/28/2023	Ground Tank at Plant	The roof for the ground storage tank is severely sagging and the hatch appears to be badly rusted. The roof and hatch must be repaired. Failure to do so can impact the quality and/or quantity of produced water.	LAC 51:XII.319.D.24 - System shall ensure that no critical water system component is in poor condition or defective.
36	11/28/2023	Ground Tank at Plant	The ground storage tank interior has not been inspected in several years. For steel tanks AWWA M42 recommends the maximum interval for periodic inspections of the tank interior should normally be three (3) years. It is usually advisable to wash out the tank at the time of inspection.	
Pumps				

Item No.	Documentation Date Start	Facility / Unit Name	Observation and Corrective Action	Code Citation
37	10/25/2021	High Service Pumps	Pump #3 in the high service pump building had a broken seal. The pump must be repaired and restored to proper working order. Failure to do so can impact the quality and/or quantity of produced water.	LAC 51:XII.319.D.24 - System shall ensure that no critical water system component is in poor condition or defective.
38	11/9/2021	High Service Pumps	The high service pump facility was operating off generator power, due to issues with the normal power supply through Entergy. At the time of inspection, there was not a secondary source of standby power for the high service pumps.	LAC 51:XII.319.D.2 and LAC 51:XII.135.A - Dedicated standby power shall be provided by any community water supply and any non-community water supply serving a hospital so that water can be treated and/or pumped to the distribution system during power outages to meet the average daily demand during the month of maximum water use. A standby power supply shall be provided through a dedicated portable or in-place auxiliary power of adequate supply and connectivity.
39	11/9/2021	High Service Pumps	A valve in the high service pump building was leaking at the time of inspection. The valve must be replaced such that the leak is repaired. Interruption of service to customers should be minimized.	LAC 51:XII.319.D.25 - All potable water systems shall be designed, constructed, and maintained so as to prevent leakage of water due to defective materials, improper jointing, corrosion, settling, impacts, freezing, or other causes. Valves and blow-offs shall be provided so that necessary repairs can be made with a minimum interruption of service.
40	1/1/2017	Low Service Pumps	Low service emergency pump #3 is not operational	LSA-R.S. 40:4, LAC 48:V.7707 and LAC 51:XII.319.D.21
41	11/28/2023	Low Service Pumps	A valve in-between the low service pumps and the pressure filters has a leak. The leak must be repaired; interruption of service to customers should be minimized.	LAC 51:XII.319.D.25 - All potable water systems shall be designed, constructed, and maintained so as to prevent leakage of water due to defective materials, improper jointing, corrosion, settling, impacts, freezing, or other causes. Valves and blow-offs shall be provided so that necessary repairs can be made with a minimum interruption of service.
42	1/1/2017	Sludge Pumps	The sludge pumps at Clarifier #1 and Clarifier #2 are not working	LSA-R.S. 40:4, LAC 48:V.7707 and LAC 51:XII.319.D.21
43	1/1/2017	Sludge Pumps	The sludge pump to the sludge pit is not connected and lime water is being pumped to a nearby small ditch located at the side of the treatment plant instead of to the approved sludge pits as originally designed and permitted.	LSA-R.S. 40:4, LAC 48:V.7707 and LAC 51:XII.319.D.21
44	11/27/2018	Pumps	Hose bib vacuum breakers are needed at all threaded hose bibs in the pump room and anywhere threaded hose bibs are found at the water plant.	
Intermediate Clearwells				
45	10/25/2021	Intermediate Clearwell #2	The southeast clearwell was in poor condition due to lime scale, apparent pinhole leaks, and rust. The clearwell must be cleaned and evaluated for repairs.	LAC 51:XII.319.D.24 - System shall ensure that no critical water system component is in poor condition or defective.

Item No.	Documentation Date Start	Facility / Unit Name	Observation and Corrective Action	Code Citation
46	10/25/2021	Intermediate Clearwell #2	The southwest clearwell appeared to have a pinhole leak at the top as evident by a long rust streak on the side of the tank. The leak must be repaired; interruption of service to customers should be minimized.	LAC 51:XII.319.D.25 - All potable water systems shall be designed, constructed, and maintained so as to prevent leakage of water due to defective materials, improper jointing, corrosion, settling, impacts, freezing, or other causes. Valves and blow-offs shall be provided so that necessary repairs can be made with a minimum interruption of service.
47	11/9/2021	Intermediate Clearwell #1	The northeast clearwell was in poor condition due to lime scale, apparent pinhole leaks, and rust. The clearwell must be cleaned and evaluated for repairs.	LAC 51:XII.319.D.24 - System shall ensure that no critical water system component is in poor condition or defective.
48	11/28/2023	Intermediate Clearwell #2	A hatch on the Southeast Clearwell was open allowing for the entrance of contaminants. All hatches must be kept closed to prevent the entrance of any contaminating material.	LAC 51:XII.319.D.14 and 337.C - Any vent, overflow, or water level control gauge provided on tanks or other structures containing water for any potable water supply shall be constructed so as to prevent the entrance of birds, insects, dust, or other contaminating material. Openings or vents shall face downward and shall be not less than 2 feet above the floor of a pump room, the roof or cover of a tank, the ground surface, or the surface of other water supply structures.
Operations				
49	1/1/2017	Operations	The water system is not implementing and enforcing the formal cross-connection control program that was adopted.	LSA-R.S. 40:4, LSA-R.S. 40:5(9) (40 CFR 141.403), and LAC 51:XII.344.A.
50	11/28/2023	Operations	The water system is not maintaining all annual testing records for customers required to install backflow prevention devices as several devices have not been tested in a couple years. The water system must maintain a list of customers required to install backflow prevention devices and a record of annual testing for each device.	LAC 51:XII.344.A-B - A. As used in this Section, “mandatory containment practices” means the containment practices prescribed in and required by the state Uniform Construction Code, LAC 17:I, including maintenance and testing requirements, and any additional or related requirements of this Part. B. In order to protect its water supply from potential contamination, each water supplier shall make a reasonable effort to ensure that only customers who comply with mandatory containment practices connect or remain connected to its water supply.
Pressure Filters				
51	1/1/2017	Pressure Filters	The filter media needs inspection and evaluation for replacement	LSA-R.S. 40:4, LAC 48:V.7707 and LAC 51:XII.319.D.22
52	6/23/2017	Pressure Filters	Most of the filter gauges inside the water treatment building and one of the gauges at Filter #4 were not working during the inspection. The water system is presently manually backwashing the filters after 72 hours based on the estimated amount of volume the water system produces at the plant. The filter gauges shall be repaired or replaced.	
53	6/23/2017	Pressure Filters	Filter #4 has a large gash/rip on the top of the filter which has resulted in Filters #3 and #4 being inoperable from the past 3-4 months. There was a broken gate valve between Filters #1 and #2, and a broken butterfly valve (stuck open) between Filters #3 and #4. The filters and the valves shall be replaced. Extension granted until Jan 31, 2019 in letter dated 9/4/2018	

Item No.	Documentation Date Start	Facility / Unit Name	Observation and Corrective Action	Code Citation
54	11/28/2023	Pressure Filters	At the main treatment plant, the pressure filters are malfunctioning as the backwash drain is constantly open during normal operations, the second pressure filter's hatch is also leaking, and the operational aerator is now leaking. The pressure filters and the aerator must be repaired or replaced. Failure to do so can impact the quality and/or quantity of produced water.	LAC 51:XII.319.D.24 - System shall ensure that no critical water system component is in poor condition or defective.
Wells				
55	11/13/2015	Well #2	At the time of inspection the flowmeter of Well #2 was not functioning. Please have the flowmeter repaired or replaced.	
56	11/27/2018	Well #2	Well #2 casing and motor were in poor condition due to heavy iron deposits and rust. The casing, motor, and discharge piping must be cleaned, evaluated for repairs, and painted. Pressure wash to remove the buildup that has occurred at the upper well terminal of well 2. Scrape and paint rusted areas as needed.	LAC 51:XII.319.D.24 - System shall ensure that no critical water system component is in poor condition or defective.
57	11/27/2018	Well #2	Rust build up occurring on screen of well vent. Clean or replace well screen to prevent obstruction of air flow of the well vent. Move the well vent up to where the spray of the water lube does not wet the vent and cause it to become clogged in the future. Make sure the well vent is down turned and at least 24 inches above final ground surface and screened with 24 mesh wire.	
58	11/9/2021	Well #2	The sample tap for Well #2 was broken and leaking at the time of inspection. The sample tap must be replaced to repair the leak.	LAC 51:XII.319.D.25 - All potable water systems shall be designed, constructed, and maintained so as to prevent leakage of water due to defective materials, improper jointing, corrosion, settling, impacts, freezing, or other causes. Valves and blow-offs shall be provided so that necessary repairs can be made with a minimum interruption of service.
59	11/28/2023	Well #2	The pressure gauge for Well #2 was missing. Add a pressure gauge to the discharge piping of the well.	LAC 51:XII.169.H.3.a.iv - The discharge piping shall be equipped with a check valve in or at the well, a shutoff valve, and a pressure gauge.
60	11/27/2018	Well #3	Rust build up occurring on screen of well vent. Clean or replace well screen to prevent obstruction of air flow of the well vent. Move the well vent up to where the spray of the water lube does not wet the vent and cause it to become clogged. Make sure the well vent is down turned and at least 24 inches above final ground surface and screened with 24 mesh wire.	
61	10/25/2021	Well #3	Well #3 casing and motor were in poor condition due to iron deposits, rust, and algae. The casing, motor, and discharge piping must be cleaned, evaluated for repairs, and painted.	LAC 51:XII.319.D.24 - System shall ensure that no critical water system component is in poor condition or defective.

Item No.	Documentation Date Start	Facility / Unit Name	Observation and Corrective Action	Code Citation
62	11/28/2023	Well #3	The well waste line for Well #3 has a leak. The leak must be repaired; interruption of service to customers should be minimized.	LAC 51:XII.319.D.25 - All potable water systems shall be designed, constructed, and maintained so as to prevent leakage of water due to defective materials, improper jointing, corrosion, settling, impacts, freezing, or other causes. Valves and blow-offs shall be provided so that necessary repairs can be made with a minimum interruption of service.
63	11/28/2023	Well #3	The flow meter for Well #3 is broken. A means of measuring flow must be provided.	LAC 51:XII.169.H.3.a.iv - The discharge piping shall be equipped with a means of measuring flow.
64	11/28/2023	Well #3	The packing on Well #3 is too loose, allowing the lubrication well to flood constantly. It is recommended to tighten the packing to prevent the flooding and future deterioration of the well.	
65	6/23/2017	Well #4	The lantern rings on Water Well #4 are leaking badly and need to be replaced.	
66	11/27/2018	Well #4	Well #4 casing and motor were in poor condition due to heavy iron deposits and rust. The casing, motor, and discharge piping must be cleaned, evaluated for repairs, and painted. Pressure wash to remove the buildup that has occurred at the upper well terminal of well 4. Scrape and paint rusted areas as needed. Also it was noted the lantern rings were leaking and either need to be repaired or replaced.	LAC 51:XII.319.D.24 - System shall ensure that no critical water system component is in poor condition or defective.
67	11/27/2018	Well #4	Move the well vent up to where the spray from the water lube does not wet the vent and cause it to become clogged. Make sure the well vent is down turned and at least 24 inches above final ground surface and screened with 24 mesh wire.	
68	11/9/2021	Well #4	Well #4 was not being used as a source of water at the time of inspection. All wells that are not being used as a source of water must be properly plugged and abandoned in accordance with LAC 56, Part I, Water Wells. Consult with a LA licensed well driller. Upon completion, provide written documentation to LDH stating that the well has been properly plugged and abandoned.	LAC 51:XII.319.D.13 and 331.A - Abandoned water wells and well holes shall be plugged in accordance with the Louisiana Water Well Rules, Regulations, and Standards. LAC 51:XII.319.D.15 and 343.A - There shall be no physical connection between a public water supply and any other water supply which is not of equal sanitary quality and under an equal degree of official supervision and there shall be no connection or arrangement by which unsafe water may enter a public water supply system.
69	11/27/2018	Well #5	Move the well vent up to where the spray of the water lube does not wet the vent and cause it to become clogged. Make sure the well vent is down turned and at least 24 inches above final ground surface and screened with 24 mesh wire.	LAC 51:XII.319.D.7 - There shall be no pathway for contamination into the well casing or discharge piping. All well appurtenances including casing shall be maintained to prevent the introduction of contamination into the well casing and discharge piping.

Item No.	Documentation Date Start	Facility / Unit Name	Observation and Corrective Action	Code Citation
70	10/25/2021	Well #5	The casing vent on Well #5 is missing a screen allowing for the entrance of contaminants. The well vent must be properly screened with mesh 24 noncorrodible screen Well #5 casing and motor were in poor condition due to iron deposits and rust. The casing, motor, and discharge piping must be cleaned, evaluated for repairs, and painted.	LAC 51:XII.319.D.7 - There shall be no pathway for contamination into the well casing or discharge piping. The vent and drawdown tube shall be maintained to prevent the introduction of contamination into the well casing and discharge piping. LAC 51:XII.319.D.24 - System shall ensure that no critical water system component is in poor condition or defective.
71	11/9/2021	Wells #2-5	The well motors were not equipped with protective guards around the rotating shafts. Belts, gears, rotating shafts, and electrical wiring should have proper shields to prevent injury.	LAC 51:XII.157.B - The design shall comply with all applicable safety codes and regulations that include, but are not limited to, the codes adopted under the authority of Act 12 of the 2005 First Extraordinary Session, State Fire Marshal regulations (see LAC 55:V), National Fire Protection Association (NFPA) standards, and federal Occupational Health and Safety Administration (OSHA) standards.
72	11/28/2023	Well #6	The casing vent for Well #6 terminates right above the concrete slab. The casing vent must terminate in a downward direction no less than 24" above the concrete slab.	LAC 51:XII.327.A.11-12 - 11. All potable water well casings shall be vented to atmosphere as provided in §327.A.12 below, with the exception that no vent will be required when single-pipe jet pumps are used. 12. All potable water well vents shall be so constructed and installed as to prevent the entrance of contamination. All vent openings shall be piped watertight to a point not less than 24 inches above the highest flood level which may have occurred in a 10-year period, but in no case less than 24 inches above the ground surface. Such vent openings and extensions thereof shall be not less than 1/2 inch in diameter, with extension pipe firmly attached thereto. The openings of the vent pipes shall face downward and shall be screened to prevent the entrance of foreign matter.

APPENDIX B – TASK 2: FIELD VISIT SUMMARY REPORT

BONTON ASSOCIATES

TASK 2 - FIELD ASSESSMENT SUMMARY REPORT

SUPPORT FOR TALLULAH, LOUISIANA
MUNICIPAL WATER SYSTEM

PROJECT NO. 177180

REVISION 0
NOVEMBER 15, 2024

CONTENTS

FIGURES

TABLES

Introduction

The following report summarizes the observations of assets and resources interviewed and includes a photo summary of the Tallulah, Louisiana water treatment plant (WTP) in Appendix A. Figure 1 and Figure 2 show the Tallulah Water WTP and process flow diagram of the water treatment process, respectfully.

Background & Purpose

Tallulah, Louisiana, the Parish seat of Madison Parish, has faced significant challenges with its water system in recent years, including boil water advisories, water outages, and insufficient funds for repairs. The system has also experienced numerous water main breaks and extensive leaks. To address this crisis, in June 2024 the Tallulah City Council voted to enter into a joint receivership with the State. Under the direction of the Governor's Office of Homeland Security and Emergency Management Preparedness (GOHSEP), Bonton Associates has been tasked with enforcing drinking water regulations, issuing administrative compliance orders, and managing civil actions and receiverships. Bonton Associates will oversee the daily operations and management of the Tallulah municipal water system and develop a detailed Corrective Action Plan (CAP) to be submitted within 90 days of the notice to proceed. The purpose of this report is to convey the findings and observations of the Tallulah WTP site visit by Burns & McDonnell that took place on November 4-5, 2024.

Review of City Assets and Interviews

Treatment Plant Assets

Groundwater Wells

The Tallulah water treatment plant (WTP) has five (5) wells fed from the Mississippi River Alluvial aquifer; Wells 2, 3, 4, 5, and 6. The plant staff generally do not know the capacities of the wells, except for Well 6. The wells do not have variable frequency drives (VFDs) and operate at a constant speed. During normal operation, the plant runs Wells 3 and 6 simultaneously; however, during the site visit by Burns & McDonnell, Wells 3, 5, and 6 were in operation causing hydraulic overloading of the aerators.

Table 1: Tallulah WTP Well Summary

Asset	Motor Starter	HP	Capacity (GPM)	Backup Power	Flow Totalizer	Operational
Well 2	Constant Speed	20	280	Yes	No	Yes*
Well 3	Constant Speed	40	380	No	No	Yes
Well 4	Constant Speed	Unknown	420	No	No	No*
Well 5	Constant Speed	30	420 - 667[1]	Yes	Yes	Yes
Well 6	Constant Speed	25	813[1] – 1,000	No	Yes	Yes

* Not used for drinking supply water ; [1] BMcD calculated via flow totalizer

Well 2 is currently not used as a drinking water supply well. The well does not have a flow totalizer or flow meter and the current production rate is unknown. It is functioning but is primarily used for filling firetrucks to clean out the solids contact clarifiers. Well 2 has backup power provided by the on-site generator. Well 2 is shown in Figure 3.

Well 3 is operational and is one of the primary supply wells for the City. The well does not have a flow totalizer or flow meter and the current production rate is unknown. During the site visit, Well 3 was running in conjunction with Wells 5 and 6, although it is typically operated with Well 6 only. This well does not have backup power. Well 3 is shown in Figure 4.

Well 4 has been out of service for an extended period. The well does not have a flow totalizer or flow meter and the current production rate is unknown. The plant staff interviewed during the site visit did not know whether the well was out of service due to mechanical failures or water quality issues. This well does not have backup power. Well 4 is shown in Figure 5.

Well 5 is operational and tied into the backup generator. It has a functioning flow totalizer, which was used by Burns & McDonnell to calculate its flow rate at approximately 667 gallons per minute (gpm) during the visit. Well 5 was running during the site visit and is shown in Figure 6.

Well 6 is the newest well, installed about 1.5 years ago, with a known capacity of 1,000 gpm. It has a functioning flow totalizer and Burns & McDonnell calculated its flow rate at approximately 813 gpm during the visit. However, it is not connected to the backup generator due to the generator's capacity limitations. This well was also running during the site visit. Well 6 is shown in Figure 7.

Aerators

An aerator in a drinking water treatment plant is a device that introduces air into the water. The primary function of aeration is to improve water quality by 1) removing dissolved gases such as carbon dioxide and hydrogen sulfide, and 2) oxidizing dissolved metals such as iron and to a lesser degree, manganese. An aeration process helps to reduce unpleasant odors and tastes, lower the concentration of volatile organic compounds (VOCs), and enhance the overall effectiveness of subsequent treatment processes. The two aerators (Figure 8 and Figure 9) at Tallulah WTP were receiving source water beyond the functional limit of the equipment. Significant overflows and ruptures in the blower housing were observed, causing significant water loss. Due to significant corrosion and overall condition, it is anticipated that the blowers are not functional, and the aerators are likely not able to provide significant process benefit in their current state. Representatives from the Louisiana Department of Health (LDH) estimated the hydraulic capacity of each aerator to be 500 gpm. Engineering documents by others indicate that the firm capacity of the plant is 1,100 gpm, which is believed to be the basis of this value. The aerators are fed directly from the discharge lines of the wells.

Solids Contact Clarifiers

Solids contact clarifiers are used in drinking water treatment plants to enhance the removal of suspended solids and other impurities from the water. These units combine several processes, including chemical treatment, mixing, flocculation, and sedimentation into a single unit. The primary function of a solids contact clarifier is to improve water quality by settling out suspended solids, reducing turbidity, and removal of hardness, metals, and other contaminants. Plant staff reported that the two (2) solids contact clarifiers at Tallulah WTP must remain in service at all times due to demands of the City's water system. Based on discussions with plant staff, Burns & McDonnell noted that training is required for plant staff to learn how to isolate the clarifiers for cleaning and maintenance. The two (2) clarifiers are above-grade steel tanks and are shown in Figure 10 and Figure 11. The clarifiers each have a volume of 76,000 gallons.

Per conversations with plant staff, lime dosing is adjusted based on the effluent pH from the clarifiers, with a target effluent pH of 10.2. During Burns & McDonnell site visit the feed setting on the lime auger was at maximum dose rate. The effluent launders of each clarifier feed into outlet pipes which connect to the intermediate clearwells (Figure 12 and Figure 13). Both Clarifiers 1 and 2 were observed in operation with sludge blankets near the bottom of the effluent launders. On the first day of observation, the sludge blanket in Clarifier 1 was approximately one to two feet below

the launders, and the next day the sludge blanket was observed to be overflowing into the launders at various instances. The weirs of Clarifier 1 appeared to be submerged most of the time while Burns & McDonnell was observing operations; this was noted to cause hydraulic short circuiting and indicates a hydraulic bottleneck downstream of the Clarifier. Additionally, the launders in Clarifier 1 were not level (i.e., were separating from the perimeter of the tank wall and slumping) and this contributes to the submerged weir issue.

The clarifiers are both operating without functioning mixing units and scraper mechanisms. The malfunctioning equipment may be caused by the significant buildup of lime solids on the mechanical equipment at the point of chemical injection. Staff report that the shaft of the mixer at Clarifier 2 is broken but this was not confirmed during the visit. Without functioning mixing units, the solids contact clarifier will not work as designed to remove solids from the water, and without scraper mechanisms, proper solids blowdown and maintenance of a sludge blanket will be difficult.

Mechanical components for sludge blowdown maintenance (i.e., valves, etc.) are reportedly not functioning or their whereabouts are unknown. Current sludge blanket cleanout procedure involves draining the clarifier(s) through the 8” drain nozzle on the side of the clarifier until the water level is at the sludge blanket, or for up to 60 minutes, and simultaneously agitating the sludge blanket with a fire hose until the sludge blanket level is at the drain nozzle or until the clarifier must be put back in operation. The blowdown and drain discharge stream flows by gravity to the nearby creek. Lime deposits from this process are visible on satellite imagery for at least one mile, and the Department of Environmental Quality (DEQ) is aware of this issue. The lime sludge pumps were not observed as the building was in a location that could not be easily accessed while on site.

Additionally, there is no alum or coagulant being fed to the clarifiers, as the alum chemical lines leaving the alum building are severed. The duration of the alum system outage is unknown.

Intermediate Clearwells

The intermediate clearwells at the Tallulah WTP are used to hold the clarifier effluent water temporarily before it undergoes further treatment. The primary function of these clearwells is to provide contact time for disinfectants to inactivate any remaining pathogens. There are three (3) steel above-grade intermediate clearwells at Tallulah WTP. Each clearwell has a volume of 25,000 gallons and are housed in steel tanks. Clarifier 1 effluent flows directly into Intermediate Clearwell 1 (Figure 14). Clarifier 2 effluent flows directly into Intermediate Clearwell 3 (Figure 15 and Figure 16). Intermediate Clearwells 1 and 3 converge into Intermediate Clearwell 2 (Figure 17). The effluent of each clearwell is near the bottom of the tanks, which may be contributing to sludge carry over present in the pressure filters (per plant staff).

Carbon dioxide and chlorine solution are dosed into Intermediate Clearwell 1 and Intermediate Clearwell 2, but the exact diffusion mechanisms and locations are unknown. Due to plant hydraulics, both of these chemicals are essentially double-dosed into the water that flows through Intermediate Clearwell1. The steel tank walls and roofs are in extremely poor condition, with

significant corrosion that has left the tanks open to the atmosphere. Additionally, plant staff indicated that a local welder advised to not make repairs to the steel, as any attempted repair welds would likely further damage the steel plates.

Low Service Pump Station

Three (3) pumps located between the intermediate clearwells and the pressure filters make up the low service pump station (LSPS) (Figure 18 and Figure 19). Suction lines for each of the LSPs are individually routed from the effluent of Intermediate Clearwell 2 directly to the pumps. The LSPs are intended to be two (2) duty and one (1) diesel-powered backup pump; however, LSP 2 has been out of service for over six (6) months and the emergency diesel-powered backup pump has been in continuous operation over that time, leaving the plant with no redundancy. The pump plates on the LSPs do not indicate a design point for the pumps. The apparent dead head pressure (maximum working pressure) is apparently 175 psi. The high pressure may have contributed to the failure of the steel vessel of the pressure filter for the out of service pressure vessels, which are designed for 75 psi. Plant staff reported that internal pump components have experienced damage from lime solids carry over.

Table 2: Tallulah WTP Low Service Pumps

Asset	Pump Type	Motor Starter	HP	Capacity (GPM)	Backup Power	Flow metering	Operational
Pump 1	Horizontal Split Case	Constant Speed	25	500	No	No	Yes
Pump 2	Horizontal Split Case	Constant Speed	25	500	No	No	No
Pump 3	Horizontal Split Case	Constant Speed	25	500	No	No	Yes

Pressure Filters

The pressure filters at the Tallulah WTP are intended to remove any remaining suspended solids, particulate iron and manganese, natural organic material, bacteria, viruses, and other contaminants from the water. Pressure Filters 3 and 4 are completely offline, and the remaining two (2) (Figure 20 and Figure 21) reportedly cannot be taken offline for maintenance due to the demand of the water system. The two (2) offline filters are reportedly inoperable because of steel vessel rupture(s) caused by over pressurization of the filters in the past. This was not confirmed in the field. The name plates on the pressure filters indicate the design pressure is 75 psi, which is below the apparent dead-head pressure of the low service pumps.

The backwashing frequency is unknown, with cycles reportedly lasting approximately five (5) minutes. Backwash is achieved by using discharge water from the low service pumps to push filtered effluent from the filter chambers in the reverse direction of a backwashing chamber. Per conversations with plant staff, the filter media contents consist of gravel at the bottom, followed by sand, with no apparent anthracite or granular activated carbon (GAC) above the sand. Plant staff also reported a significant amount of lime sludge is present above the media.

Leaks were observed at locations where severe metal corrosion on steel plating has occurred. Similar to the intermediate clearwells, City staff reported a welder inspected the filters and indicated the steel plating is so thin that repair welds cannot be performed without risking further damage to the filter.

There was no apparent standard operating procedure (SOP) for filter backwash and plant staff appeared to not have adequate training on the purpose or procedure for backwashing. Filter backwashing was reportedly not performed based on any of the normal industry triggers (i.e., run time, turbidity, or headloss), but rather it is performed when there are any number of other process issues at the plant. The isolation valve for the filter nearest the operations room is not functioning, which requires that both filters are taken out of service during the backwash procedure. During a backwash performed during the site visit, one of the isolating valves on the filter feed header failed to fully close, which could result in contaminating the feed header with backwash waste if left uncorrected.

Final On-site Clearwell and Elevated Storage Tank

The Final Clearwell at the Tallulah WTP receives effluent from the pressure filters (Figure 22) and stores water before pumping to the distribution system from the high service pump station (HSPS). The Final Clearwell is a 500,000 gallon above-ground storage tank. Representatives from LDH reported that the Final Clearwell has a sunken, or low spot, on the roof of the tank which accumulates standing water. To date, no infiltration from the standing water into the final clearwell has been observed.

The elevated storage tank (Figure 23), located outside of the WTP, is of steel construction and aids in maintaining consistent pressure and supply throughout the distribution system. It was observed that the head range on the tank is 35 ft. The elevated tank was not observed to provide any supplemental storage or pressure to the system during the site visits; reportedly caused by High Service Pump (HSP) 2 being out of service, which is the only pump with enough discharge pressure to fill the elevated tank.

High Service Pump Station

There are three (3) high service pumps (HSPs) (Figure 24) which are used to provide finished water to the distribution system and fill the elevated storage tank. During the site visit, HSP 2 was out of service due to an undiagnosed issue which resulted in overvoltage on the pump motor. With HSP 2 out, the resulting system pressure was steady at approximately 30 psi for both days of the site visit, as measured on the discharge header of HSP 1 and in the control room. This pump issue was later diagnosed as a result of improper grease lubrication of the pump bearings. Following pump repair, system pressure returned to the normal 50 psi. A valve on the exterior of the HSP Station feeding the elevated tank is reportedly seized half-open and cannot be manually actuated, which plant staff indicated was contributing to the system pressure issue.

The pumps are rebuilt every six (6) months, indicating potential alignment problems. There was a natural gas leak for the diesel engine in the HSP room, with a service technician plumber scheduled to evaluate it on November 7, 2024.

Plant staff reported that past pump repairs and rebuilds indicated lime sludge carry-over into the pumps which was wearing out mechanical components and causing calcium deposit buildup. The designed discharge head on HSPs 1 and 3 is unknown; however, as mentioned the system pressure with these pumps running was 30 psi. City staff should evaluate if rehabilitation of HSPs 1 and 3 will result in higher discharge pressure to match that of HSP 2; if this is not achievable, the City should replace HSPs 1 and 3 with higher discharge pressure pumps to match HSP 2. There may also be issues with the pressure relief valves, as discussed with staff, but this was not confirmed. The pump plate on HSP 2 indicates a discharge pressure of 150 psi but is only able to produce a system pressure of 50 psi. The plates on HSPs 1 and 3 are illegible and the pump rating is unknown.

One (1) additional natural gas-powered backup pump is present in the HSP station, but according to plant staff it is not functional and has been out of service for several years. The reason the pump is out of service is unknown.

Table 3: Tallulah WTP High Service Pumps

Asset	Pump Type	Motor Starter	HP	Capacity (GPM)	Backup Power	Flow metering	Operational
Pump 1	End Suction	Unknown	25	Unknown	No	No	Yes
Pump 2	End Suction	Unknown	25	500	No	No	No
Pump 3	End Suction	Unknown	25	Unknown	No	No	Yes
Pump 4	Horizontal Split Case	Unknown	50	1,000	Yes	No	No

Chemical Feed Systems

The lime feed system (Figure 25) doses hydrated lime and the feed rate is manually adjusted via a speed dial on the feeder auger. Each clarifier has a dedicated mix tank with overflow line that feeds into the center of the clarifier (Figure 26 and Figure 27) with no redundancy. During the site visit, the lime mix tanks were observed to be overflowing into the associated secondary containment, which was also overflowing, and lime solution was present on the floor and nearly every surface inside and outside of the lime building. It was observed that the drain line from the secondary containment basin was intended to discharge within piping that likely connects into the clarifier blowdown piping. However, these containment drainpipes were cut or clogged, resulting in significant deposits of lime on the ground surface between the clarifiers and the lime building. Per discussion with plant staff, the lime system is typically operated at maximum feed rate and the carrier water flow rate is not controlled. Any adjustments to lime dose may be adjusted manually by turning down the auger speed to reach the target clarifier effluent pH of 10.2. On the second day of the site visit, Burns & McDonnell worked with plant staff to reduce the amount of lime and carrier water into the mix tanks which resulted in no overflows from the mix tanks while Burns &

McDonnell remained on-site. The lime storage system consists of an outdoor storage silo which feeds a supply hopper on the top of the lime building. The supply hopper feeds into the hopper for Clarifier 1. The hopper for Clarifier 1 must be used to transfer lime to the hopper for Clarifier 2. Lime is transferred between hoppers by compressed air. During lime transfer between hoppers, it was observed that blower effluent used to move the lime was discharging to atmosphere outside of the building without any kind of dust collection or dust arrestor.

The WTP has equipment to feed alum coagulant to the solids contact clarifiers (Figure 28); however, the chemical lines are severed before they reach the clarifiers (Figure 29) and the system is currently not in service. There are two (2) bulk storage tanks and a transfer pump for alum on the ground level of the lime building, and a day tank and two(2) metering pumps on the second level of the alum building. It was reported by plant staff that the transfer pump is functioning and the metering pumps showed signs of functionality, although this was not confirmed in the field due to apparent lack of alum available.

The chlorine feed system consists of two (2) in-service 150-lb chlorine gas cylinders with vacuum regulators (Figure 30). Carrier water pulls chlorine gas through the regulators at an eductor which creates a chlorine solution. The chlorine solution line exits the chlorine storage shed and is routed along the ground to intermediate Clearwells 2 and 3. This solution pipe had previous repairs using pipe splices and other means and was observed to be submerged in standing water between the intermediate clearwells (Figure 31). The pipe material for the exterior routing of the chlorine solution line is unknown. On the first day of site visits, it was observed that chlorine gas was fed at 108 pounds per day (ppd) and plant staff reported that chlorine residual is not measured anywhere at the plant, and the chlorine demand is unknown. On the second day of the site visits, at a gas feed of 108 ppd, the chlorine residual was measured on the filter effluent at 11.2 mg/L, which is believed to be the detection limit of the equipment used. This value is more than United States Environmental Protection Agency's (EPA's) regulatory limit for chorine residual which is 4.0 mg/L. The chlorine gas feed was continually reduced to approximately 40 to 50 ppd to achieve a target chlorine residual of 4.0 mg/L at the filter effluent. Plant staff do not have a finished water sample point identified for chlorine residual measurement; this should be established and monitored frequently.

The carbon dioxide (CO2) feed system consists of a liquefied gas tank and evaporator unit and is fed as a gas from a single line which splits to Intermediate Clearwell 1 and Intermediate Clearwell 2 (Figure 32). Carbon dioxide gas is dosed for recarbonization of the clarifier effluent for pH adjustment and stabilization. The exact dosing location and diffusion mechanism for carbon dioxide could not be observed. It was reported by plant staff that the dose is adjusted based on the available carbon dioxide in the bulk storage tank, turning it down when low and back up when replenished; rather than dosing to maintain a target effluent pH, as would be recommended.

Recommendations

Each treatment process system at the Tallulah WTP was assessed for condition, functionality, and the ability to provide a reasonable level of treatment. The assessments were a combination of interviews with LDH representatives, City of Tallulah staff, plant staff, Bonton Associates, and the observations of Burns & McDonnell. The initial and preliminary recommendations summarized in Table 4 below are for a 10-year service horizon.

Table 4: Tallulah WTP Treatment Unit Assessments

Asset	Recommendation	Comments
Well 2	Abandon	Well has not been in regular operation for years.
Well 3	Install VFDs to control flow and pressure. Install flow meter and pressure gauge to measure discharge pressure and flow.	City should consider procuring services from a certified well inspector to perform down-well inspections and assess condition of well.
Well 4	Abandon	Well has not been in regular operation for years.
Well 5	Install VFDs to control flow and pressure. Install flow meter and pressure gauge to measure discharge pressure and flow.	City should consider procuring services from a certified well inspector to perform down-well inspections and assess condition of well.
Well 6	Install VFDs to control flow and pressure. Install flow meter to measure discharge flow rate.	City should consider procuring services from a certified well inspector to perform down-well inspections and assess condition of well.
Aerators	Replace with new aerator or oxidant feed	The aerators do not appear to provide aeration benefit, and the mechanical equipment is not in working order. These are a hydraulic bottleneck, and the blowers will need to be replaced.
Solids Contact Clarifier 1	Replace or rehabilitate the mixer, scraper mechanism, blow down piping, and launders. Steel tank needs to be recoated.	The condition of blowdown piping and sludge pumps is unknown.
Solids Contact Clarifier 2	Replace or rehabilitate the mixer, scraper mechanism, and blow down piping. Steel tank needs to be recoated.	The condition of blowdown piping and sludge pumps is unknown.
Intermediate Clearwell 1	Replace	The condition of the clearwell steel and roofing is extremely poor and cannot be repaired by welding.
Intermediate Clearwell 2	Replace or alternatively Intermediate Clearwell 2 could be removed from service and Intermediate Clearwells 1 and 3 could feed a common suction header for LSPS.	The condition of the clearwell steel and roofing is extremely poor and cannot be repaired by welding.
Intermediate Clearwell 3	Abandon – provide new pipe routing to Intermediate Clearwell 2. Alternatively Intermediate Clearwell 2 could be removed from service and Intermediate	The condition was acceptable but needs to be recoated. This clearwell provides no treatment benefit.

Asset	Recommendation	Comments
	Clearwells 1 and 3 could feed a common suction header for LSPS.	
Low Service Pumps 1, 2 and 3	Replace with lower discharge pressure pumps more suitable for the pressure filter vessels.	Pumps are all in poor condition. Plant staff have reported that the pump internal components have experienced internal degradation due to lime slurry carry-over from clarifiers.
Pressure Filters 1 & 2	Rehabilitate valves, coating, and filter media or replace entire filter vessels.	These filters are currently in-service. Filter media needs to undergo analysis and may need replacement. Welder has indicated repairs are highly risky due to condition.
Pressure Filters 3 & 4	Replace	These filters are offline due to reported rupture(s) and the condition of steel vessel is poor. Welder has indicated repairs are highly risky due to condition.
Finished Water Clearwell	Rehabilitate roof or replace	Clearwell is in poor condition and the sunken spot on the roof of the tank must be addressed if the tank is to remain in service.
High Service Pumps 1, 2 and 3	Replace	Pumps are all in poor condition. Plant staff have reported that the pump internal components have experienced internal degradation due to lime slurry carry-over from clarifiers.
High Service Pump 4 (Emergency Backups)	Replace or rehabilitate	Pump has not been functional for a number of years.
Lime Feed System	Replace mixing tank, secondary containment basin, and carrier water feed line and control valve. Rehabilitate the lime building and surrounding areas impacted by lime build up. Blower exhaust needs to have bag filter to catch lime dust.	Lime equipment and building is generally in very poor condition. Lime contamination due to improper feed of lime and carrier water is an extremely serious problem at the plant and must be addressed. Code and life safety compliance was not part of the review and would be a follow up after establishing working treatment is established.
Chlorine Feed System	Replace chlorine feed line routing to injection point. Install a new chlorine scrubber system for life safety.	The chemical feed line is in extremely poor condition and must be replaced. Code and life safety compliance was not part of the review and would be a follow up after establishing working treatment is established.
Alum Feed System	Replace alum lines feeding into the center of the clarifiers.	Alum is currently not fed to clarifiers due to line breakages. Code and life safety compliance was not part of the review and would be a follow up after establishing working treatment is established.

Asset	Recommendation	Comments
Carbon Dioxide Feed System	Perform additional inspection by equipment supplier to confirm functionality. Rehabilitate CO2 feed lines to injection points.	The injection point and diffusion method is unknown. Equipment is aging and functionality is unknown. Code and life safety compliance was not part of the review and would be a follow up after establishing working treatment is established.

APPENDIX A – PHOTOGRAPH LOG OF ASSETS

Figure 1: Tallulah Water Treatment Plant

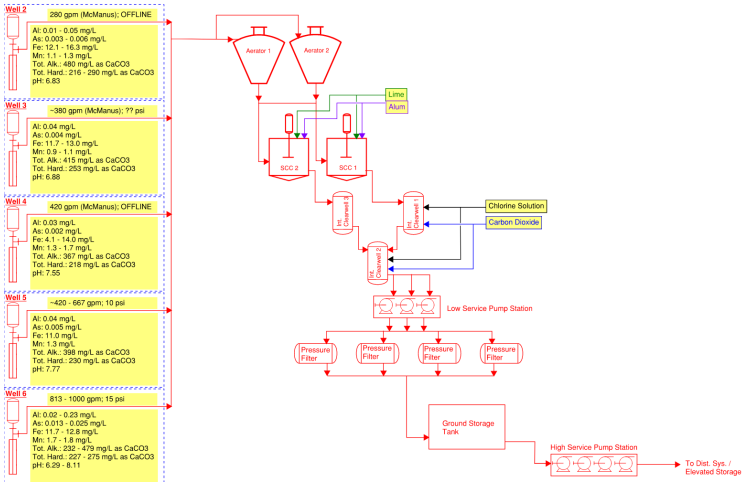

Figure 2: Process Flow Diagram of WTP

Figure 3: Well Head 2

Figure 4: Well Head 3

Figure 5: Well Head 4

Figure 6: Well Head 5

Figure 7: Well Head 6

Figure 8: Aerators

Figure 9: Aerator Blower

Figure 10: Solids Contact Clarifier #1

Figure 11: Solids Contact Clarifier #2

Figure 12: Solids Contact Clarifier #1 Launders

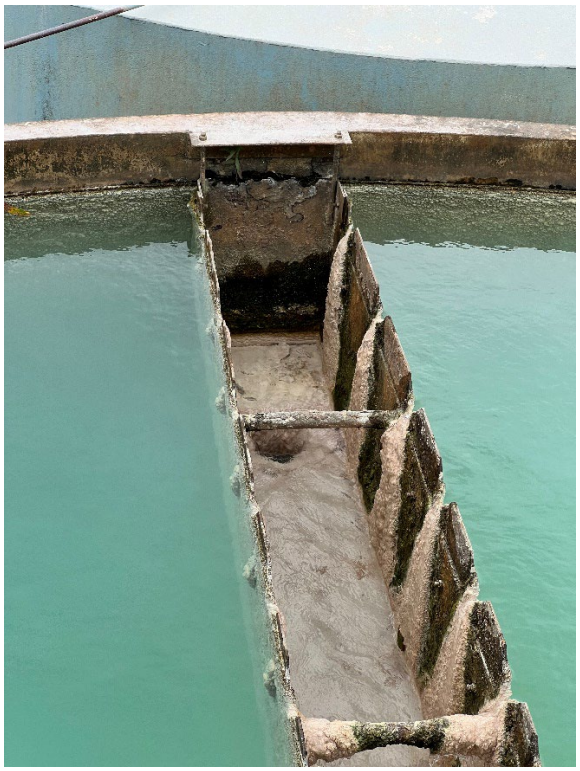

Figure 13: Solids Contact Clarifier #2 Launders

Figure 14: Intermediate Clearwell #1

Figure 15: Intermediate Clearwell #3

Figure 16: Clarifier #2 Effluent into Intermediate Clearwell #3

Figure 17: Intermediate Clearwell #2

Figure 18: Low Service Pump Station

Figure 19: Low Service Pump Station

Figure 20: Pressure Filter #2

Figure 21: Pressure Filter #3

Figure 22: Final Clearwell (Ground Storage)

Figure 23: Elevated Storage Tank

Figure 24: High Service Pumps

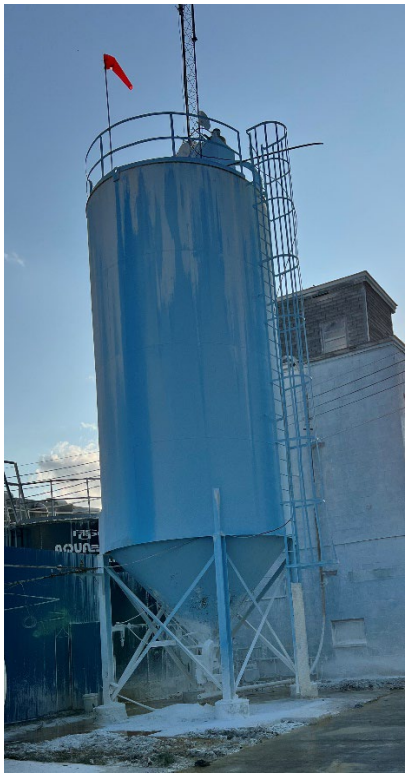

Figure 25: Lime Silo

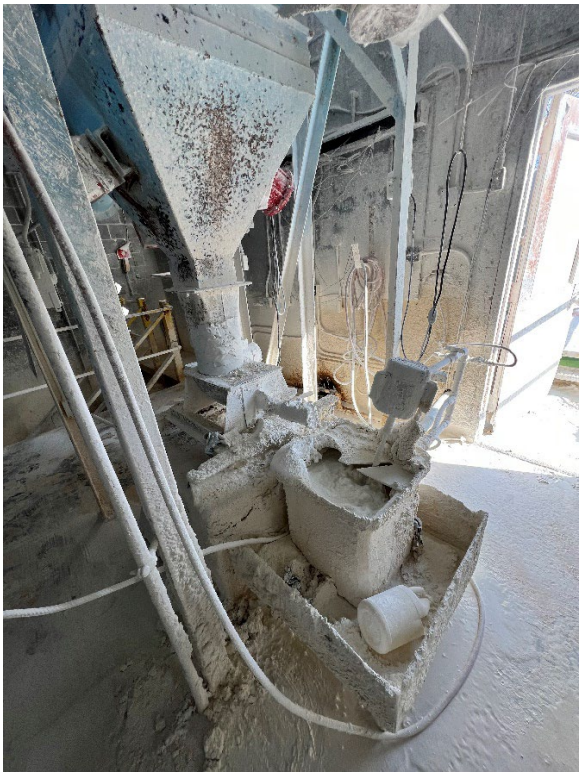

Figure 26: Lime Mixer Basin for Clarifier #1

Figure 27: Lime Mixer Basin for Clarifier #2

Figure 28: Coagulant (Alum) Storage

Figure 29: Coagulant (Alum) Feed Lines

Figure 30: Chlorine Feed System

Figure 31: Chlorine Feed Line Underwater

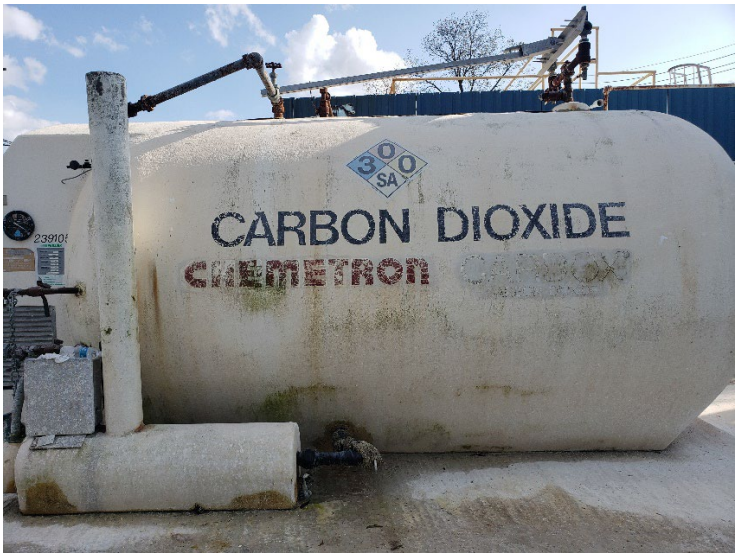

Figure 32: Carbon Dioxide Storage Tank


BURNS McDONNELL

APPENDIX C – CORRECTIVE ACTION SUMARY TABLE

		Phase I - Baseline Reliability Improvements					Phase II - Final System Sustainability Improvements			Additional Corrective Actions								
		Group 1 - Perform Each					Group 2 - Select One Option			Group 3 - Perform Each		Group 4 - Perform Each						Group 5 - Perform Each
		High priority	High priority	High priority	High Priority	Moderate priority	High priority			High priority	High priority	Moderate priority	High priority	High priority	Moderate priority	High priority	High priority	Moderate priority	High priority
Item No. (Reference Table 4 of Appendix A)	**Description of Violation**	**New Connection with Regional Water Wholesaler**	**Structural Repairs to Ground Storage Tank**	**Rehabilitate High Service Pump Station**	**Water Main Leak Detection and Repair Program**	**Water Meter Replacement Program (AMI)**	**CIP Option 1: New Water Well + Plant Rehab**	**CIP Option 2: New Well + New Plant**	**CIP Option 3: Wholesale Water Provider**	**Plug and Abandon Wells #2, #3, and #4**	**Modifications to Well Existing Wells #5 and #6**	**Payment of SDWA Admin Fee**	**Operator Level 3 Certification & Training**	**Water Sampling Plan**	**Elevated Tank Maintenance Items**	**Develop Water Master Plan**	**Develop ArcGIS Inventory**	**Implement Flushing Program**	**City-Implemented Corrective Actions**
	Corrective Action Identification	**CA-1**	**CA-2**	**CA-3**	**CA-4**	**CA-5**	**CA-6**	**CA-7**	**CA-8**	**CA-9**	**CA-10**	**CA-11**	**CA-12**	**CA-13**	**CA-14**	**CA-15**	**CA-16**	**CA-17**	**CA-18**
Administration																			
1	System has not remitted payment of the Safe Drinking Water Administrative Fee											D							
Aerator																			
2	The aerator closest to the filter gallery was leaking heavily at the time of inspection. Filter #2 was leaking and rusting.	D					D	D	D										
Chemical / Chemistry																			
3	A cover is not provided on the slaking box and lime is spilling into the treatment plant	D					D	D	D										
4	The Aluminum Sulfate pump is leaking at the tanks	D					D	D	D										Repair leaking pump
5	There is no personal safety equipment or suits for the operator to use in the lime room	D					D	D	D										Purchase safety PPE
6	The colorimeters are not being used properly	I					I	I	I				I	D					
7	The alum bulk storage tanks were not provided with secondary containment.	D					D	D	D										
8	Chlorine cylinders in the chlorine room and stored outdoors were not properly restrained.	D					D	D	D										Add restraint chains
Clarifiers																			
9	The ball valve for Clarifier #1 is broken	D					D	D	D										
10	The flash mixer for Clarifier #1 is not working	D					D	D	D										
11	The scraper drive at Clarifier #1 was not working properly	D					D	D	D										
12	The weirs of Clarifier #1 and Clarifier #2 are in need of cleaning	D					D	D	D										
Distribution System																			
13	The water system cannot take any water plant facilities out of service for maintenance or repair because of the demand within the distribution system.	D			I	I	D	D	D							I			
14	CR -Inadequate Min Chlorine Residual (GW&SW) Minimum Disinfection Residuals in Distribution System	I					I	I	I				I	I				I	
15	The City of Tallulah must work out an agreement with the neighboring water system to obtain an emergency source of water in the case of an emergency.	D							D										
16	CT -5% DS Below Min 0.5-2 Months Consec (GW)	I					I	I	I				I	I					
17	Follow-up or Routine Tap M/R (LCR)				D									D					
18	Coliform levels out of compliance	I			I		I	I	I				I	I					
19	Manganese Sample Result: 0.45 MG/L MCL: 0.3 MG/L	D					D	D	D					I				I	
20	The Tallulah Water System has numerous leaks throughout the distribution system.				D	I													
21	The system is not completing the “Monthly Chlorine Residual at Additional Chlorine Residual Sites” report form.												I	D					
22	Level 1 Assess, Multiple TC POS (RTCR)	I			I		I	I	I				I	I					
Elevated Tank																			
23	Erosion occurring underneath the center riser column of the elevated tank.														D				
24	The fence surrounding the elevated tank is overgrown with vegetation in several places.														D				
25	The screen on the elevated tank overflow was broken at the time of inspection.														D				
26	Remove the hose and threads on the sample tap of the elevated storage tank to provide a compliant sample tap.														D				
27	The pressure gauge for the elevated storage tank is broken. Repair or replace the pressure gauge.														D				
Generator / Backup Power																			
28	Provide adequate number and sized generators to produce the power needed to operate the plant in an emergency.	D					D	D	D										
Ground Tank at Plant																			
29	The ladders shall be locked whenever plant personnel are not present at the plant site in order to prevent trespassing, vandalism, and sabotage.	D	D				I	I	I				I						Install lock on ladder
30	The two drain valves on the ground storage tank were cracked and appeared to be leaking at the time of inspection.	D	D				D	D	D										
31	A continuous, lockable security fence must be provided around the facility for protection against unauthorized access, and the vegetation shall be removed.	D					D	D	D				I						Install fence and implement regular vegetation removal (i.e. mowing/ weed eating)
32	Tanks shall be painted and/or provided cathodic protection to prevent rust and corrosion.	D	D				D	D	D										
33	Several thick tree roots appeared to have grown into the rear bottom of the tank on top of the slab.	D	D				D	D	D										
34	The screen on the ground storage tank overflow is broken.	D	D				D	D	D										
35	The roof for the ground storage tank is severely sagging and the hatch appears to be badly rusted.	D	D				D	D	D										
36	The ground storage tank interior has not been inspected in several years.	D	D				D	D	D				I						Initiate tank inspection
Pumps																			
37	Pump #3 in the high service pump building had a broken seal.	D		D			D	D	D										Replace pump seal
38	At the time of inspection, there was not a secondary source of standby power for the high service pumps.	D					D	D	D										
39	A valve in the high service pump building was leaking at the time of inspection.	D		D			D	D	D										
40	Low Service Pump #3 (Emergency standby) is not operational	D					D	D	D										
41	A valve in-between the low service pumps and the pressure filters has a leak.	D					D	D	D										
42	The sludge pumps at Clarifier #1 and Clarifier #2 are not working	D					D	D	D										
43	The sludge pump to the sludge pit is not connected and lime water is being pumped to a nearby small ditch.	D					D	D	D										
44	Hose bib vacuum breakers are needed anywhere threaded hose bibs are found at the water plant.	D					D	D	D										Install hose bib vacuum breakers
Intermediate Clearwells																			
45	The southeast clearwell was in poor condition due to lime scale, apparent pinhole leaks, and rust.	D					D	D	D										
46	The southwest clearwell appeared to have a pinhole leak at the top as evident by a long rust streak on the side of the tank.	D					D	D	D										
47	The northeast clearwell was in poor condition due to lime scale, apparent pinhole leaks, and rust.	D					D	D	D										
48	A hatch on the southeast clearwell was open allowing for the entrance of contaminants	D					D	D	D										
Operations																			
49	The water system is not implementing and enforcing the formal cross-connection control program that was adopted.					I							I				I		
50	The water system is not maintaining all annual testing records for customers required to install backflow prevention devices.					I							I						
Pressure Filters																			
51	The filter media is in need of inspection and evaluation for replacement	D					D	D	D										
52	Most of the filter gauges inside the water treatment building and one of the gauges at Filter #4 are not working.	D					D	D	D										Replace key gauges for filters in use
53	Filter #4 has a rupture on the top of the filter which has resulted in Filters #3 and #4 being inoperable.	D					D	D	D										
54	The pressure filters are malfunctioning and the second pressure filter's hatch is leaking.	D					D	D	D										
Wells																			
55	The flowmeter of Well #2 was not functioning.	D								D									
56	Well #2 casing and motor were in poor condition due to heavy iron deposits and rust.	D								D									
57	Rust build up is occurring on screen vent of Well #2. The well vent must be relocated.	D								D									
58	The sample tap for Well #2 was broken and leaking at the time of inspection.	D								D									
59	The pressure gauge for Well #2 was missing.	D								D									
60	Rust build up is occurring on vent screen of Well #3. The well vent must be relocated.	D								D									
61	Well #3 casing and motor were in poor condition due to iron deposits, rust, and algae.	D								D									
62	The well waste line for Well #3 has a leak.	D								D									
63	The flow meter for Well #3 is broken.	D								D									
64	The packing on Well #3 is too loose allowing for the lubrication well to flood constantly.	D								D									
65	The lantern rings on Water Well #4 are leaking badly and need to be replaced.	D								D									
66	Well #4 casing and motor were in poor condition due to heavy iron deposits and rust.	D								D									
67	Relocate the Well #4 vent so it does not become clogged.	D								D									
68	Wells #2 and #4 are not being used as a source of water must be properly plugged and abandoned.	D								D									
69	Relocate the Well #5 vent to avoid clogging and contamination.	D									D								
70	The casing vent on Well #5 is missing a screen allowing for the entrance of contaminants. Well #5 casing and motor were in poor condition due to iron deposits and rust.	D									D								
71	Motors for Well #2, #3, #4, and #5 are not equipped with protective guards around the rotating shafts.	D								D	D								
72	The casing vent for Well #6 must be relocated.	D									D								

D = Directly Addresses Open Violation
I = Indirectly Addresses Open Violation

APPENDIX D – MEMORANDUM: EMERGENCY STABILIZATION OPTIONS FOR TALLULAH WATER TREATMENT PLANT

December 4, 2024

Jennifer Kihlken, P.E.
Deputy Chief Engineer of Field Operations (Southwest and North Louisiana)
Louisiana Department of Health
628 North 4th St
Baton Rouge, LA 70802

RE: Emergency Stabilization Options for Tallulah Water Treatment Plant

Dear Ms. Kihlken:

As the court-appointed receiver for the Tallulah Water System, Bonton Associates has been actively working to stabilize operations and ensure regulatory compliance while addressing the urgent challenges posed by the deteriorating infrastructure at the Tallulah Water Treatment Plant. In this memorandum and detailed attachment, we summarize the current conditions, the resulting risks, and present a detailed evaluation of five emergency stabilization options.

Our goal is to provide LDH, the Governor's Office, and other key stakeholders with a comprehensive understanding of the situation to facilitate prompt, informed decision-making. Immediate action is needed to address service, safety, and compliance risks while considering impacts on funding for long-term sustainability.

Executive Summary

The Tallulah Water Treatment Plant (WTP) is experiencing significant operational challenges that threaten its ability to reliably produce and distribute safe drinking water. Key deficiencies include severely deteriorated equipment, ineffective filtration processes, excessive lime carryover, and unstable pressure levels in the distribution system. These issues have led to frequent pump failures, boil advisories, service disruptions, and unsafe working conditions for operators.

Developing, funding, and implementing long-term solutions will take time, during which these conditions will continue to pose significant risks to service continuity, operator safety, and regulatory compliance. To mitigate these risks, this memorandum presents five potential emergency stabilization options, ranging from minimal intervention to comprehensive solutions such as a temporary mobile treatment plant or a temporary tie-in with the Walnut Bayou Water System.

Each option is evaluated for its cost, implementation timeline, impact on service continuity and operator safety, together with risks to long-term funding. The following table summarizes these options to aid in selecting the most appropriate course of action.

Comparison Table: Emergency Stabilization Options

Option	Description	Estimated Cost	Timeline	Risk to Funding Sources	Risk to Service Continuity	Risk to Operator Safety
1: Minimal Intervention Approach	Emergency repairs and limited interventions to sustain operations.	$1,270,000 + TBD	Immediate, underway	**Increases**	**Negligible**	**Increases**
2: Sequential Improvement Approach	Phased repairs to address critical issues and improve reliability and safety.	$885,000 + TBD	6–9 months	**Increases**	**Lowers (incrementally)**	**Lowers (possibly)**
3: Temporary Mobile Pressure Filters	Replaces inoperable filters with mobile units for immediate gains.	$1,940,000 + TBD	2–3 months	**Increases**	**Lowers (incrementally)**	**Lowers**
4: Temporary Mobile Treatment Plant	Comprehensive standalone solution bypassing existing infrastructure.	$2,590,000 + TBD	3–4 months	**Increases**	**Lowers**	**Lowers**
5: Temporary Tie-In with Walnut Bayou	Connects to Walnut Bayou system to source treated water.	$2,885,000 - $3,655,000	6–8 months	**Increases (TBD)**	**Lowers**	**Lowers**

Key Take-Aways

- Note, all options increase the risk to available long-term funding sources.
- While the **Minimal Intervention Approach (Option 1)** is the least expensive option upfront, the ongoing need for onsite engineering and operational support may lead to costs exceeding available ARPA funds, potentially impacting long-term funding availability. It should also be noted that this option doesn't immediately address safety and service continuity risks.
- **Option 2 (Sequential Improvement Approach)** provides a phased strategy for stabilization but introduces uncertainties regarding repair costs for key components, including clarifiers and pressure filters.
- **Option 3 (Temporary Mobile Pressure Filters)** builds on Option 2 while providing faster filtration and safety improvements at a potentially higher cost.
- **Option 4 (Temporary Mobile Treatment Plant)** bypasses all existing infrastructure upstream of the ground storage and high-service pump station, offering the most reliable short-term solution at a significant rental cost.

- **Option 5 (Temporary Tie-In with Walnut Bayou**) is potentially the most expensive option but ensures improved finished water quality, safety and service continuity by supplementing required flows with water purchased from Walnut Bayou. However, this option involves uncertainties related to cost-sharing agreements with Walnut Bayou.

We trust this memorandum provides the context and insights necessary to support your evaluation of the available emergency stabilization options. We welcome the opportunity to discuss these findings in more detail and collaborate on the next steps to ensure the continued provision of safe and reliable drinking water to the residents of Tallulah.

For further detail, please refer to the following sections, along with attached documents for in-depth descriptions of existing conditions, cost breakdowns, and risk assessments for each option.

Sincerely,

Darius Bonton, P.E., MBA
President | Chief Executive Officer
Bonton Associates

Attachments:

1. WesTech_Mobile Treatment_Pressure Filter_Rental.pdf
2. Draft Task 2 – Field Assessment Summary Report_DRAFT.pdf

CC:
Amanda Ames, P.E.
Barbara Featherston, P.E.
Melissa Blake
Pamela Netterville Grady
Michael Ellis, P.E.
Charles Caballero, P.E.
Megan Terrell

Introduction

As the court-appointed receiver for the Tallulah Water System, Bonton Associates is tasked with operating and maintaining the system in accordance with the Stipulated Consent Judgment and the pertinent requirements, stipulations, and authority of La. R.S. 40:5.9 and La. R.S. 40:5.9.1. These responsibilities include:

1. Collecting the assets of the public water system and overseeing its operation and maintenance pursuant to La. R.S. 40:5.9(C).
2. Incurring and paying, within available operating funds, all usual and customary expenses, including electricity charges, supplies, materials, and necessary repair costs.
3. Operating the system "as is" in compliance with relevant provisions of La. R.S. Title 40, LDH regulations, and all applicable permits and orders, provided such compliance is feasible given monetary constraints and the current condition of the system.

Additionally, under Section 2.4 of our Statement of Work, Bonton Associates is required to provide staff augmentation for all personnel necessary to maintain daily operations and to address deficiencies that pose immediate health or safety risks to water quality.

These provisions underscore our responsibility to maintain service continuity, ensure compliance with water quality standards where feasible, and uphold safe working conditions throughout the receivership period.

This memorandum focuses exclusively on **emergency stabilization options** for the Tallulah Water Treatment Plant. These options are intended to sustain service and improve operator safety while long-term solutions are identified, funded, and implemented. Based on our current assessment, we estimate that the process of developing and implementing comprehensive long-term improvements may take 12–24 months.

It is important to note that this memorandum:

- Does not present any long-term solutions for the plant.
- Does not address deficiencies in the distribution system contributing to excessive water loss.

We are fully aware of these conditions and will provide detailed guidance on options to address them in the comprehensive corrective action plan. The forthcoming corrective action plan will outline viable long-term solutions for achieving system sustainability and will be submitted to LDH in accordance with the stipulated judgment timeline.

By focusing on immediate stabilization measures, this memorandum aims to provide a clear framework for informed decision-making and prioritization of resources to address the most urgent risks currently facing the plant.

Tallulah Water Treatment Plant - Observations and Actions Taken

Conditions Observed

Since mobilizing as the court-appointed receiver, Bonton Associates has identified significant operational deficiencies at the Tallulah Water Treatment Plant (WTP). These deficiencies are primarily attributable to aging and malfunctioning equipment, compounded by excessive lime usage and a lack of redundancy in key processes. A summary of specific conditions include:

- Aerators: Both aerators are receiving source water beyond the functional limits of the equipment, resulting in overflows and ruptures in the blower housing. This has caused significant water loss, and the aerators are unable to provide meaningful process benefits in their current state.

- Clarifiers: Clarifiers 1 and 2 are nonfunctional due to a lack of mixing units and scraper mechanisms, both caused by lime buildup at the chemical injection point. This has inhibited solids removal and maintenance of a proper sludge blanket.
- Lime Dosing and Hydraulic Bottleneck: Lime dosing has been set to the maximum feed rate, targeting an effluent pH of 10.2. Submerged weirs on Clarifier 1 indicate a hydraulic bottleneck, causing short circuiting and reducing production capacity.
- Low Service Pumps: One duty pump had been out of service for six months, while the diesel-powered backup pump operated constantly. Excessive lime solids carryover has caused frequent pump failures.
- Pressure Filters: Filters 3 and 4 are offline due to ruptures from past over-pressurization. The remaining two filters, which cannot be taken offline for maintenance, exhibit pressurized leaks and are believed to contain significant lime sludge, requiring excessive pressures to process water (design pressure: 75 psi; observed pressure: 175 psi). This creates a significant safety hazard for operators.
- High Service Pumps: HSP 2 has failed twice since Bonton Associates mobilized, both due to lime sludge impacting pump bearings. During these outages, the plant has been unable to restore pressure in the elevated tank, risking service continuity.
- Valve and Isolation Issues: A seized valve on the exterior of the high service pump station, along with limited isolation capabilities throughout the plant, has contributed to system pressure instabilities and limited routine maintenance capacity.

Personnel Response and Immediate Remedial Measures

Since mobilizing, Bonton Associates has provided personnel for oversight and support of plant operations and maintenance functions. Key actions undertaken include:

- **Pump Repairs:** Our team repaired and reinstated one low service pump and High Service Pump (HSP) 2, successfully restoring system pressures to 50 psi. After HSP 2 failed again on 11/25/24, it was promptly repaired overnight and returned to service on 11/26/24.
- **Leak Remediation:** We repaired pressurized leaks on Pressure Filters 1 and 2; however, new leaks have since developed near the access hatches, highlighting the ongoing challenges with maintaining the structural integrity of these aging filters.
- **Valve Replacements:** We completed the installation of a new valve on the distribution line feeding the elevated storage tank on 12/3/24 to enhance pressure stability. During this process, we identified a failed valve in the open position downstream of the pressure filters, which was creating a hydraulic loop. This loop caused backflow pressure from the high service pumps and elevated storage onto the pressure filters and the high service pump station. The new valve installations not only eliminate these hydraulic loops and backflow issues but also enable the installation of isolation valves throughout the plant, significantly improving maintenance and emergency repair capabilities moving forward.
- **Operational Support:** We expanded plant staffing to meet critical operational demands and support ongoing emergency maintenance requirements.

These measures summarize our efforts to stabilize operations and mitigate immediate risks through minimal intervention.

Ongoing Impacts of Current System Deficiencies

The current state of the Tallulah Water Treatment Plant (WTP) has resulted in significant impacts, including regulatory noncompliance, reduction of system reliability and service continuity, and safety risks for operators and the public. These issues are detailed below:

1. Noncompliance

- The system has been deemed operationally unacceptable by LDH, receiving an "F" letter grade for 2022 and 2023, as defined in La. R.S. 40:5.9.1.
- The plant has failed to fully comply with Administrative Order No. C-18-065-055-REQ, issued on or about January 2, 2019.
- There are at least 25 outstanding significant deficiencies that remain unaddressed, further exacerbating noncompliance with applicable regulations and operational standards.

2. Reliability

- Both the low and high service pump stations are highly susceptible to frequent failures due to excessive lime usage, creating ongoing risks to pressure stability throughout the distribution system.
- These vulnerabilities have led to repeated service disruptions, including boil water advisories, notices requesting limited water usage, and increased risks to fire protection services.

3. Safety

- The pressure filters, operating under extreme conditions, pose a significant safety hazard for plant personnel. Excessive lime sludge contributes to over-pressurization, creating risks of equipment rupture and leaks.
- Airborne lime deposits from excessive lime usage further compromise operator safety and working conditions.
- Standing water throughout interior and exterior plant spaces creates slip hazards and increases exposure risks for personnel.
- Improper grounding in the control room has resulted in at least one lightning strike, leading to a small fire, highlighting the need for immediate corrective action to improve electrical safety.

These conditions underscore the critical need for short-term stabilization measures to mitigate immediate risks, as developing, funding, and implementing long-term solutions will require time—during which the ongoing challenges and their consequences will continue to jeopardize safety and operational stability.

Available Options for Emergency Stabilization

For clarity, we're defining the short-term timeframe as encompassing the period from the present until comprehensive long-term system improvements are identified, funded, and implemented. Depending on the availability of funding, we estimate the short-term timeframe lasting for a minimum of 12 months with a possibility of extending up to 24 months.

As the court-appointed receiver, Bonton Associates is responsible for overseeing operations and ensuring compliance with regulatory standards as outlined in the Stipulated Consent Judgment and the Statement of Work. While the stipulated judgment limits our liability for operational deficiencies, our goal is to implement a balanced approach that avoids sacrificing system stability, service continuity, and safety in the short-term while we work with LDH and other stakeholders to identify and implement long-term system improvements.

We also recognize and seek to balance the funding tradeoffs between short-term emergency stabilization efforts and the long-term sustainability of the system. To this end, we're currently drafting a long-term corrective action plan that will document existing operational and administrative system conditions, as well as viable options for achieving long-term system improvements and sustainability. The corrective action plan will be submitted to LDH in January of 2025.

The following sections provide a detailed analysis of five potential options for stabilizing operations at the Tallulah Water Treatment Plant. Each option reflects varying levels of intervention and associated trade-offs in cost, timeline, and impact on system performance. These options are presented to support informed decision-making while addressing the immediate risks posed by the current state of the system. To evaluate the potential impacts of each option, risks are categorized as follows:

- **Lower:** Indicates the option is expected to reduce the negative impact associated with a specific condition.
- **Negligible:** Indicates the option is anticipated to have no discernible impact on a specific condition, either positive or negative.
- **Increases:** Indicates the option is thought to heighten the negative effects associated with a specific condition.

This framework provides a consistent and straightforward method to assess and compare the risks associated with each stabilization option.

Option 1: Minimal Intervention Approach

The Minimal Intervention Approach involves essential emergency repairs to sustain the current operation of the WTP without major modifications or enhancements to its existing infrastructure. This approach is designed to keep the plant operational while minimizing immediate costs.

High and low service pumps, which frequently fail due to excessive lime sludge, would continue to be repaired or replaced as needed. Engineering and operational support personnel will oversee repairs, monitor conditions, and maintain compliance with water quality regulations. Night shift operations will be maintained to address the 24-hour production needs of the plant.

This option is implementable immediately but does not address critical safety risks, filtration inefficiencies, or systemic instability. The ongoing repair costs and labor needs could exhaust ARPA funds, limiting resources for long-term improvements. There is also a high likelihood that additional issues may arise, such as ruptured pressure filters.

Option 1: Scope and Cost

Component	Details	Cost
Pressure Filter and High Service Pump Effluent Lines	Install Insert A Valves under pressure (Dec 2024) in two locations downstream of pressure filters and high service pump station to relieve backflow pressure throughout the plant and provide a means for isolating the plant components for maintenance.	$80,000
Ongoing Pump Repairs and Replacements (High Service Pumps)	Replacement of 3 pumps annually at $35,000 each ($105,000); Install check/gate valves ($50,000); Monthly repairs at $15,000 each ($180,000 annually).	$335,000
Ongoing Pump Repairs and Replacements (Low Service Pumps)	Replacement of 2 pumps annually at $30,000 each ($60,000); Install check/gate valves ($50,000); Bi-monthly repairs at $8,000 each ($48,000 annually); Diesel-powered standby pump replacement ($30,000).	$188,000

Component	Details	Cost
Labor Costs - Night Shift Operations	24-hour plant operation.	$85,000
Labor Costs* - Engineering and Operations Support (Project Engineer)	30 hours per week at $168.27/hour for 12 months.	$350,000
Labor Costs - Certified Operator	Certified operator to train and manage unlicensed staff at $109.25/hour for 12 months.	$227,240
EST'D TOTAL COST OPTION 1 (next 12-mos)	**$1,270,000 + TBD**	

* The increased level of operational instability and complexity will require additional Project Engineer support to oversee daily monitoring, documentation, and reporting of system conditions, coordinate emergency repair efforts, and maintain communication with stakeholders, including plant staff, city officials, and LDH.

Option 1: Risk Assessments

- **Risk to Funding Sources (Increases):** Ongoing repair costs and additional labor expenses risk depleting ARPA funds, reducing available resources for long-term improvements.
- **Risk to Service Continuity (Negligible):** This option sustains current operations without significantly improving system reliability, maintaining the status quo.
- **Risk to Operator Safety (Increases):** Continuing reliance on compromised equipment, including over-pressurized filters, increases safety risks to plant personnel.

Option 2: Sequential Improvements Approach

This approach emphasizes a phased strategy to prioritize critical repairs and upgrades, addressing the most urgent issues first to stabilize core systems while planning for additional improvements. By focusing on enhancing operational reliability, reducing safety risks, and incrementally restoring system functionality, this option creates a pathway for sustained stabilization over time.

The existing pressure filters require comprehensive rehabilitation to restore functionality, address structural issues, and improve operational reliability. Necessary repairs include:

- Structural Repairs: Address ruptures in the steel vessels of Pressure Filters 3 and 4 caused by over-pressurization. Replace corroded steel plating on all filters to prevent leaks and ensure structural integrity.
- Valve Replacements: Replace the malfunctioning isolation valve nearest the operations room to enable independent operation of each filter during backwash procedures. Replace the isolating valve on the filter feed header to prevent contamination of the feed header with backwash waste.
- Media Replacement: Remove accumulated lime sludge and replace the existing media layers, including gravel and sand, with a proper filter media configuration (e.g., anthracite, sand, and granular activated carbon) to improve filtration performance.
- Operational Improvements: Develop and implement standard operating procedures (SOPs) for backwashing, ensuring backwash is performed based on industry triggers such as turbidity, headloss, or runtime. Provide training for plant staff on proper backwashing protocols and the purpose of the pressure filters.

Implementation can begin immediately, with high-priority repairs such as installing the Insert-A-Valve (scheduled for December 2024) and replacing pumps in early 2025. However, full stabilization will depend on securing funding beyond the remaining ARPA resources to address all identified needs effectively.

This option is also anticipated to achieve a net reduction in annual chemical costs through right-sized lime dosing, facilitated by improved operational control and system stabilization. It is important to note that additional issues, such as structural repairs to the intermediate clearwells and sediment removal or structural evaluations for the 500,000-gallon ground storage tank, may emerge as further assessments are conducted. Addressing these issues could require additional resources under this phased approach.

Option 2: Scope and Cost

Component	Details	Cost
Pressure Filter and High Service Pump Effluent Lines	Install Insert A Valves under pressure (Dec 2024) in two locations downstream of pressure filters and high service pump station to relieve backflow pressure throughout the plant and provide a means for isolating the plant components for maintenance.	$80,000
Clarifiers	Perform structural evaluations and adjust lime dosing protocols to optimize performance. Proper lime dosing is critical to maintaining effluent quality and reducing lime carryover.	TBD
High Service Pumps*	Replacement of 3 pumps at $35,000 each ($105,000); Install check/gate valves for improved isolation and maintenance capabilities ($50,000).	$155,000
Low Service Pumps*	Replace two duty pumps and the diesel-powered backup pump at $30,000 each ($90,000); Install check/gate valves for improved isolation and maintenance capabilities ($50,000).	$140,000
Pressure Filters (Repairs)	Comprehensive rehabilitation, including structural repairs, valve replacements, media replacement, operational improvements, and staff training. Cost TBD.	TBD
Chlorine Line	Replace and reposition the line to reduce safety hazards and ensure compliance. Cost TBD.	TBD
Labor Costs - Night Shift Operations	24-hour plant operation.	$85,000
Labor Costs - Engineering and Operations Support (Project Engineer)**	30 hours per week at $168.27/hour for 9 months.	$196,500
Labor Costs - Certified Operator	Certified operator to train and manage unlicensed staff at $109.25/hour for 12 months.	$227,240
EST'D TOTAL COST OPTION 2 (next 12-mos)	**$885,000 + TBD**	

* This option eliminates the need for recurring pump repairs due to right-sized lime dosing and sludge removal.
**As critical systems are stabilized, the demand for onsite engineering support will decrease from 12 to 9 mos.

Option 2: Risk Assessments

- **Risk to Funding Sources (Increases):** While this phased approach spreads costs over time, the cumulative expense may still risk depleting existing ARPA and state/federal funds, potentially delaying long-term improvements if funding is insufficient for later phases.
- **Risk to Service Continuity (Lowers - incrementally):** Incremental improvements reduce service disruptions but do not address all operational deficiencies immediately.
- **Risk to Operator Safety (Lower - possibly):** Repairs to clarifiers and filters reduce operational risks, but safety improvements depend on the success of these interventions.

Option 3: Temporary Mobile Pressure Filters

This approach builds upon the critical repairs and upgrades outlined in Option 2 but prioritizes immediate improvements in filtration functionality and operator safety by replacing the existing inoperable pressure filters with temporary mobile units. Boperaty bypassing the limitations and challenges of the current infrastructure, this strategy enhances operational stability and ensures regulatory compliance.

Implementation of this option can commence immediately, starting with urgent repairs such as installing the Insert-A-Valve (scheduled for December 2024) and replacing pumps in early 2025. However, achieving full stabilization will require funding beyond the remaining ARPA funds to support all necessary interventions.

This option is also expected to yield a net reduction in annual chemical costs through improved operational control and right-sized lime dosing, enhancing overall system efficiency and reducing excess chemical usage. It should be noted, however, that additional issues not outlined herein—such as structural repairs to the intermediate clearwells or sediment removal and structural evaluations of the 500,000-gallon ground storage tank—may emerge and require further resources under this approach.

Option 3: Scope and Cost

Component	Details	Cost
Pressure Filter and High Service Pump Effluent Lines	Install Insert A Valves under pressure (Dec 2024) in two locations downstream of pressure filters and high service pump station to relieve backflow pressure throughout the plant and provide a means for isolating the plant components for maintenance.	$80,000
Clarifiers	Perform structural evaluations and adjust lime dosing protocols to optimize performance. Proper lime dosing is critical to maintaining effluent quality and reducing lime carryover.	TBD
High Service Pumps*	Replacement of 3 pumps at $35,000 each ($105,000); Install check/gate valves for improved isolation and maintenance capabilities ($50,000).	$155,000
Low Service Pumps*	Replace two duty pumps and the diesel-powered backup pump at $30,000 each ($90,000); Install check/gate valves for improved isolation and maintenance capabilities ($50,000).	$140,000
Pressure Filters (Replace)**	Deploy two 750 GPM temporary mobile pressure filters to replace the existing inoperable filters. These filters will provide	$1,052,080

Component	Details	Cost
	adequate filtration capacity to remove suspended solids, contaminants, and lime sludge, ensuring compliance with water quality standards and improving operational reliability.	
Chlorine Line	Replace and reposition the line to reduce safety hazards and ensure compliance. Cost TBD.	TBD
Labor Costs - Night Shift Operations	24-hour plant operation.	$85,000
Labor Costs* - Engineering and Operations Support (Project Engineer)**	30 hours per week at $168.27/hour for 9 months.	$196,500
Labor Costs - Certified Operator	Certified operator to train and manage unlicensed staff at $109.25/hour for 12 months.	$227,240
EST'D TOTAL COST OPTION 3 (next 12-mos)	**$1,940,000 + TBD**	

* This option eliminates the need for recurring pump repairs due to right-sized lime dosing and sludge removal.
**Initial quote from WesTech is presented. Additional quotes from other suppliers have been requested.
***As critical systems are stabilized, the demand for onsite engineering support will decrease from 12 to 9 mos.

Option 3: Risk Assessments

- **Risk to Funding Sources (Increases):** Filter rental expenses significantly increase short-term costs, limiting available resources for long-term projects.
- **Risk to Service Continuity (Lowers - incrementally):** Filtration improvements immediately enhance system reliability; however, incremental improvements to the rest of the system will address operational deficiencies and reduce service disruptions over time.
- **Risk to Operator Safety (Lower):** Replacing compromised filters significantly reduces safety risks immediately.

Option 4: Temporary Mobile Treatment Plant

This option entails deploying a temporary mobile treatment plant to comprehensively address system-wide operational challenges, including deficiencies in filtration, lime sludge management, and pressure regulation. Unlike Options 1, 2, and 3, this approach bypasses the complexities and limitations of the existing infrastructure entirely, offering a standalone, reliable solution for stabilizing water treatment and distribution.

By providing improved operational control and system stabilization, this option is also expected to achieve a net reduction in annual chemical costs, similar to Options 2 and 3. The right-sized lime dosing enabled by the mobile plant reduces excess chemical usage while enhancing treatment efficiency.

Although this solution eliminates reliance on the existing infrastructure, it does not address certain long-term concerns, such as sediment removal and structural evaluations of the 500,000-gallon ground storage tank. These issues may require separate interventions outside the scope of this temporary stabilization effort.

Option 4: Scope and Cost

Component	Details	Cost
Pressure Filter and High Service Pump Effluent Lines	Install Insert A Valves under pressure (Dec 2024) in two locations downstream of pressure filters and high service pump station to relieve backflow pressure throughout the plant and provide a means for isolating the plant components for maintenance.	$80,000
Temporary Mobile Plant Rental*	Two (2) Mobile RapiSands™ w/ Chemical Feed Center ($32,140 Each / Month) and Three (3) Mobile Horizontal Pressure Filters ($30,870 Each / Month)	$1,882,680
Additional One-Time Mobile Plant* Costs	Lot of 4,000 lbs of Sand ($4,740); Initial Media Fill ($63,570); Field Services ($54,300); Rental Yard Outbound and Return Charges ($5,700)	$128,320
Additional Construction Services Not Included with Mobile Plant Cost	See WesTech proposal provided under separate cover.	TBD
High Service Pumps**	Replacement of 3 pumps at $35,000 each ($105,000); Install check/gate valves for improved isolation and maintenance capabilities ($50,000).	$155,000
Labor Costs - Night Shift Operations***	24-hour plant operation (4 mos only).	$28,333
Labor Costs**** - Engineering and Operations Support (Project Engineer)**	30 hours per week at $168.27/hour (4 mos only).	$87,500
Labor Costs - Certified Operator	Certified operator to train and manage unlicensed staff at $109.25/hour for 12 months.	$227,240
EST'D TOTAL COST OPTION 4 (next 12-mos)	**$2,590,000 + TBD**	

*Revised quote from WesTech is presented.
** This option eliminates the need for recurring pump repairs due to right-sized lime dosing and sludge removal.
*** Once the system is up and running, the demand for 24-hour operations will decrease to 4 mos.
****Once the system is up and running, the demand for onsite engineering support will decrease to 4 mos.

Option 4: Risk Assessments

- **Risk to Funding Sources (Increases):** Mobile plant rental expenses significantly increase short-term costs, limiting available resources for long-term projects.
- **Risk to Service Continuity (Lowers):** Bypassing the compromised plant ensures reliable service.
- **Risk to Operator Safety (Lower):** Eliminates risks from existing infrastructure deficiencies.

Option 5: Temporary Tie-In with Walnut Bayou

This option entails creating a temporary interconnection with the Walnut Bayou Water System to either supplement or fully replace the Tallulah Water Treatment Plant's production. To proceed, it will be necessary to confirm the Tallulah system's demand by monitoring flows on the existing discharge line, as well as verifying Walnut Bayou's capacity to provide sufficient supply without adversely impacting their operations.

By sourcing treated water directly from Walnut Bayou, this approach bypasses the challenges posed by Tallulah's existing treatment infrastructure, ensuring immediate improvements in service continuity and operational stability. Additionally, it alleviates strain on compromised equipment within the Tallulah system, enabling more targeted repairs and assessments of critical components.

The process of establishing this temporary tie-in is anticipated to take approximately 6–8 months, which includes time for design, permitting, construction, and system integration. However, the timeline is contingent on successful collaboration with Walnut Bayou, as well as timely regulatory approvals. Any delays in permitting, construction, or integration could extend the schedule and necessitate further resources.

A key benefit of this option is the expected reduction or elimination of chemical costs at the Tallulah plant, as sourcing treated water from Walnut Bayou would remove the need for lime dosing and other chemical treatments. This advantage, combined with the opportunity to stabilize operations, underscores the potential of this solution. A meeting with Walnut Bayou engineers is scheduled for December 13th to confirm feasibility and align on next steps.

Option 5: Scope and Cost

Component	Details	Cost
Pressure Filter and High Service Pump Effluent Lines	Install Insert A Valves under pressure (Dec 2024) in two locations downstream of pressure filters and high service pump station to relieve backflow pressure throughout the plant and provide a means for isolating the plant components for maintenance.	$80,000
High Service Pumps	Replacement of 3 pumps at $35,000 each ($105,000); Install check/gate valves for improved isolation and maintenance capabilities ($50,000).	$155,000
Low Service Pumps	Replace two duty pumps and the diesel-powered backup pump at $30,000 each ($90,000); Install check/gate valves for improved isolation and maintenance capabilities ($50,000).	$140,000
Interconnection Infrastructure	Construct approximately 2 miles of 12" pipeline; install flow control valves and metering stations.	$1,500,000
Cost of Water from Walnut Bayou	Treated water at $3/1,000 gallons; anticipated flow range: 0.5 MGD to 1.2 MGD.	$547,500–$1,314,000
Labor Costs - Night Shift Operations	24-hour plant operation (8 mos only).	$56,666
Labor Costs** - Engineering and Operations Support (Project Engineer)**	30 hours per week at $168.27/hour (8 mos only).	$175,000
Labor Costs - Certified Operator	Certified operator to train and manage unlicensed staff at $109.25/hour for 12 months.	$227,240
EST'D TOTAL COST OPTION 5 (12-mos)	**$2,885,000 - $3,655,000**	

Option 5: Risk Assessments

- **Risk to Funding Sources (Increases - TBD):** The significant upfront cost of constructing the pipeline and the ongoing cost of purchasing water from Walnut Bayou increases the risk of depleting ARPA and other funding sources, potentially delaying long-term improvements. Details for sharing these upfront costs between Tallulah and Walnut Bayou will need to be negotiated and memorialized through a Cooperative Endeavor Agreement (CEA). Until the terms and conditions of this CEA are determined, risks to funding sources cannot be fully assessed. The most conservative condition assumes Tallulah would bear the full burden of both upfront costs and ongoing water purchase expenses, though offsets may exist in the form of reduced or eliminated production expenses at the Tallulah plant.
- **Risk to Service Continuity (Lowers):** Sourcing treated water from Walnut Bayou will stabilize the supply, reducing the likelihood of service disruptions, boil water advisories, and fire protection issues.
- **Risk to Operator Safety (Lower):** This option eliminates reliance on compromised equipment at the Tallulah plant, significantly reducing safety risks for operators.

APPENDIX E – PREVIOUS BIDS AND SUMMARY OF GREENFIELD WATER TREATMENT PLANT EQUIPMENT

Plant Asset	Quantity	Capacity or Size (each)
Aerators	3	575 gpm
Aerators Concrete Basin	1	24'x42'x4' (30,000-gal)
Solids Contact Clarifiers		
Mixer Motors	2	1 HP
Scraper Mechanisms	2	1 HP
Circular Concrete Basins	2	140,000-gal circular basins 40-ft diameter 15-ft sidewall depth
Sulfuric Acid - 50wt%		
Bulk Storage Tank	1	6,500-gal
Day Tank	1	150-gal
Chemical Metering Pumps	2	125 gpd Peristaltic Metering Pumps
Lime System: Feed and Silo	1	27 tons or 980 cu.ft.
Low Service Pump Station	3	33.5 HP pumps (575 gpm) Constant Speed
Pressure Filters w/ Greensand, Sand, & Gravel	3	12,000-gal vessel (575 gpm) 112 cu.ft. sand 112 cu.ft. greensand 37 cu.ft. gravel
Ground Storage Tank	1	0.5 MG Tank
High Service Pump Station	3	33 HP pumps (750gpm) VFDs
Gravity Thickener		
Scraper Mechanisms	1	1 HP
Circular Concrete Basin	1	35,000-gal circular basin 20-ft diameter 15-ft sidewall depth
Sludge Pumps	2	0.5 HP (70 gpm)
Belt Filter Press or Centrifuge	1	8,000 gpd sludge influent 3,500 ppd dry solids influent
Conveyor	1	
Filtrate & Decant Pumps	2	1 HP (100 gpm) Constant Speed
Drying Bed for Dewatered Solids	1	15-ft x 30-ft Pad
Gas Chlorine Feed System Chlorine Vacuum Eductor Feed Systems (Chlorinators)	2	150 ppd units
Polymer Feed System	1	13 ppd polymer feed 200 mg/L polymer
Phosphate		
Chemical Storage Totes	1	6,500-gal
Day Tank	1	10-gal

December 19, 2023

City of Tallulah
204 North Cedar Street
Tallulah, Louisiana 71282

Attn: Hon. Charles M. Finlayson,
Mayor

Re: City of Tallulah
Water System Improvements
LAWSP 10947
Project No. 18-04-663E

Dear Mayor Finlayson:

Bids were received and opened publicly on December 14, 2023, 10:00 AM, at City Hall, Tallulah, Louisiana. The following documents pertain to said bid opening:

a. Bid Opening Report for Contract A – New Water Well (1 copy).
b. Attendance, Roster for Contract A (1 copy).
c. Executed Bid Tabulation, for Contract A (1 copy).
d. Attendance Roster for Contract D – Rehabilitation of the Water Treatment Plant (1 copy).
e. Bid Opening Report for Contact D (1 copy).
f. Executed Bid Tabulation, for Contract D (1 copy).
g. Bid Results & Updated Budget (1 copy).

The apparent lowest, responsible bidder for Contract A – New Water Well, is Watson Well Drilling & Construction, LLC, Rayville, Louisiana, with a bid of $ 600,365.00.

The apparent lowest, responsible bidder for Contract D – Rehabilitation of the Water Treatment Plant, is Womack & Sons Construction Group, LLC, Harrisonburg, Louisiana, with a bid of $ 18,388,340.00.

Upon your review, if there are questions or need for additional information, please contact this office at any time.

I remain sincerely,
Ken McManus
McManus Consulting Engineers, Inc.

Kenneth C. McManus, P.E.

Copy To: USDA Rural Development, Monroe Regional Office, 2410 Old Sterlington Road, Monroe, Louisiana 71203
c/o Ms. Katina Spencer (w/enclosure)
State of Louisiana, Division of Administration, Office of Community Development, Claiborne Building,
Post Office Box 94095, Baton Rouge, Louisiana 70804-9095
c/o Ms. Traci Watts, Director, LGA (w/enclosure)
The Boles Law Firm, 1818 Avenue of America, Monroe, Louisiana 71201
c/o Mr. William R. Boles, Bond Attorney (w/enclosure)
MCE File (w/enclosure)

McManus Consulting Engineers, Inc. *Post Office Box 4318* *Monroe, Louisiana 71211*
Telephone: (318) 343-5600 *Facsimile: (318) 343-5717* *Email: mcmanusengineers@yahoo.com*

Sign-in Sheet

McManus Consulting Engineers, Inc.
P. O. Box 4318 (71211)
116 Smelser Rd.
Monroe, LA 71202
Phone: (318) 343-5600, 343-5460
Fax: (318) 343-5717

City of Tallulah
Contract A- New Water Well
Project No. 18-04-663E

BID OPENING

Date: Thursday, December 14, 2023 @ 10:00 AM
Location: Tallulah Town Hall, 204 N. Cedar Ave., Tallulah, LA 71282

ATTENDANCE

Ken McManus	MCE, INC.
Cinnamon Gooding	MCE, Inc.
Blake Bell	Madison Sand
Gerald Edom	Tallulah City
Yvonne Lewis	City of Tallulah
Antonio Wilson	
Randy Windham	Womack and Sons
Chelvin R. Taylor	MAYOR/CITY OF TALLULAH

McManus Consulting Engineers, Inc.
Monroe, LA 71202

BID OPENING REPORT

BIDS WERE OPENED ON: December 14, 2023
FOR: City of Tallulah
PRE-BID ESTIMATE: $ 515,000

TIME: 10:00 AM
PROJECT NO. 18-04-663E
PROJECT NAME: Contract A- New Water Well

1. Watson Well Drilling and Construction, LLC $ 600,365.00
   41 Norris Lane
   Rayville, LA 71269

Signed: Ken McManus, PE

Dated: December 14, 2023

NOTE: THE ABOVE BID AMOUNTS HAVE NOT BEEN CHECKED. THE BID TOTALS ARE SUBJECT TO CORRECTION AFTER THE BIDS HAVE BEEN COMPLETELY REVIEWED.

CITY OF TALLULAH
CONTRACT A- NEW WATER WELL
PROJECT NO. 18-04-663E

BID TABULATION

Bids Opened
Date: Thursday, December 14, 2023
Time: 10:00 AM
Place City of Tallulah, 204 North Cedar Street, Tallulah, LA 71282

Computed By: Ken McManus, P.E.

ITEM NO.	DESCRIPTION	QUANTITY & UNIT	1 WATSON WELL DRILLING AND CONSTRUCTION, LLC RAYVILLE, LA UNIT PRICE	TOTAL
1	DRILL TEST WELL & LOG, COMPLETE	200 LF	$ 44.00	$ 8,800.00
2	INITIAL PUMP TEST, COMPLETE	JOB	LS	9,000.00
3	BASIC CHEMICAL ANALYSIS	JOB	LS	2,000.00
4	COMPREHENSIVE CHEMICAL ANALYSIS	JOB	LS	8,000.00
5	16" DIA. STEEL WELL CASING, CEMENT, COMPLETE	111 LF	$ 1,009.00	112,120.00
6	16" DIA. STEEL WELL CASING BLANK	10 LF	$ 500.00	5,000.00
7	16" DIA. STAINLESS STEEL WELL SCREEN	40 LF	$ 200.00	8,000.00
8	10" DIA. STEEL PUMP COLUMN	102 LF	$ 285.00	29,070.00
9	10" DIA. STEEL TAIL PIPE	55 LF	$ 25.00	1,375.00
10	GRAVEL PACK AND DISINFECT WELL	JOB	LS	84,000.00
11	INTERMEDIATE PUMP TEST, COMPLETE	JOB	LS	6,000.00
12	CONCRETE WELL FOUNDATION, COMPLETE	JOB	LS	8,000.00
13	STEEL COVER FOR WELL, COMPLETE	JOB	LS	5,500.00
14	VERTICAL TURBINE PUMP, WELL-HEAD, SEAL, PIPING, METER, VALVES, COMPLETE	JOB	LS	52,000.00
15	ELECTRICAL PANELS, CIRCUITS, CONTROLS, COMPLETE	JOB	LS	60,000.00
16	FINAL PUMP TEST, COMPLETE	JOB	LS	15,000.00
17	SITE WORK, YARD PIPING, VALVES, CONNECTIONS, FILL, COMPLETE	JOB	LS	12,000.00
18	GRAVEL DRIVE AREA, 15 C.Y. CRUSHED STONE, 30 C.Y. S.C.G. W/ CULVERT, COMPLETE	JOB	LS	10,000.00
19	3" DIA. PRESSURE RELIEF DISCHARGE PIPE ASSEMBLY	JOB	LS	6,000.00
20	START-UP, TRAINING, CLEAN-UP AND MISCELLANEOUS WORK	JOB	LS	10,500.00
21	ABANDON AND CAP WELL NO. 2, 3, AND 4	JOB	LS	130,000.00
22	MOBILIZATION	JOB	LS	17,000.00
23	PROJECT SIGN	1 EA	$ 1,000.00	1,000.00
	TOTAL BASE BID AMOUNT			$600,365.00

SIX HUNDRED THOUSAND, THREE HUNDRED SIXTY-FIVE DOLLARS & 00/100

STATE OF LOUISIANA
Kenneth C. McManus
License No. 19878
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING

AMOUNT OF PROPOSAL GUARANTEE: 5%

SURETY: Western Surety Company

COMMENTS:

I hereby certify that the above is a true and correct summary of proposals received.

Ken McManus, PE
Kenneth C. McManus, P.E.

December 19, 2023

City of Tallulah
204 North Cedar Street
Tallulah, Louisiana 71282

Attn: Hon. Charles M. Finlayson,
Mayor

Re: City of Tallulah
Water System Improvements
LAWSP 10947
Project No. 18-04-663E

Dear Mayor Finlayson.

Bids were received and opened publicly on December 14, 2023, 10:00 AM, at City Hall, Tallulah, Louisiana. The following documents pertain to said bid opening:

a. Bid Opening Report for Contract A – New Water Well (1 copy).
b. Attendance, Roster for Contract A (1 copy).
c. Executed Bid Tabulation, for Contract A (1 copy).
d. Attendance Roster for Contract D – Rehabilitation of the Water Treatment Plant (1 copy).
e. Bid Opening Report for Contact D (1 copy).
f. Executed Bid Tabulation, for Contract D (1 copy).
g. Bid Results & Updated Budget (1 copy).

The apparent lowest, responsible bidder for Contract A – New Water Well, is Watson Well Drilling & Construction, LLC, Rayville, Louisiana, with a bid of $ 600,365.00.

The apparent lowest, responsible bidder for Contract D – Rehabilitation of the Water Treatment Plant, is Womack & Sons Construction Group, LLC, Harrisonburg, Louisiana, with a bid of $ 18,388,340.00.

Upon your review, if there are questions or need for additional information, please contact this office at any time.

I remain sincerely,
Ken McManus
McManus Consulting Engineers, Inc.

Kenneth C. McManus, P.E.

Copy To: USDA Rural Development, Monroe Regional Office, 2410 Old Sterlington Road, Monroe, Louisiana 71203
c/o Ms. Katina Spencer (w/enclosure)
State of Louisiana, Division of Administration, Office of Community Development, Claiborne Building,
Post Office Box 94095, Baton Rouge, Louisiana 70804-9095
c/o Ms. Traci Watts, Director, LGA (w/enclosure)
The Boles Law Firm, 1818 Avenue of America, Monroe, Louisiana 71201
c/o Mr. William R. Boles, Bond Attorney (w/enclosure)
MCE File (w/enclosure)

McManus Consulting Engineers, Inc. *Post Office Box 4318* *Monroe, Louisiana 71211*
Telephone: (318) 343-5600 *Facsimile: (318) 343-5717* *Email: mcmanusengineers@yahoo.com*

McManus Consulting Engineers, Inc.
P. O. Box 4318 (71211)
116 Smelser Rd.
Monroe, LA 71202
Phone: (318) 343-5600, 343-5460
Fax: (318) 343-5717

Sign in Sheet

City of Tallulah
Contract D – Rehabilitate Water Treatment Plant
Project No. 18-04-663E

BID OPENING

Date: Thursday, December 14, 2023 @ 10:00 AM
Location: Tallulah Town Hall, 204 N. Cedar Ave., Tallulah, LA 71282

ATTENDANCE

Ken McManus	MCE, Inc.
Cinnamon Gaiding	MCE Inc
Blake Bell	Madison Journal
Gerald Odom	City
Yvonne Lewis	City of Tallulah
Antonio Wilson	
Randy Windham	Womack and Sons.

McManus Consulting Engineers, Inc.
Monroe, LA 71202

BID OPENING REPORT

BIDS WERE OPENED ON: December 14, 2023
FOR: City of Tallulah
PRE-BID ESTIMATE: $ 11,500,000

TIME: 10:00 AM
PROJECT NO. 18-04-663E
PROJECT NAME: Contract D- Rehabilitate Water Treatment Plant

1. Womack and Sons Construction Group, LLC
   5739 Highway 8 East
   Harrisonburg, LA 71340
   $ 18,388,340.00

2. Hemphill Construction Company, Inc.
   1858 Highway 49, South
   Florence, MS 39073
   $ No Bid

3. Mitchell Contracting, Inc.
   420 Highway 1085
   Madisonville, LA 70447
   $ No Bid

4. Morgan Contracting, Inc. of Florida
   900 Dutch Valley Drive
   Knoxville, TN 37918
   $ No Bid

5. Dixie Overland Construction, LLC
   380 Burson Road
   Sibley, LA 71073
   $ No Bid

Signed: Ken McManus, PE

Dated: December 14, 2

NOTE: THE ABOVE BID AMOUNTS HAVE NOT BEEN CHECKED. THE BID TOTALS ARE SUBJECT TO CORRECTION AFTER THE BIDS HAVE BEEN COMPLETELY REVIEWED.

CITY OF TALLULAH
CONTRACT D - REHABILITATION OF WATER TREATMENT PLANT
PROJECT NO. 18-04-663E

BID TABULATION

Bids Opened
Date: Thursday, December 14, 2023
Time: 10:00 AM
Place: City of Tallulah, 204 North Cedar Street, Tallulah, LA 71282

Computed By: Ken McManus, P.E.

ITEM NO.	DESCRIPTION	QUANTITY & UNIT	1 WOMACK AND SONS CONSTRUCTION GROUP, LLC HARRISONBURG, LA UNIT PRICE	TOTAL
1	ADMINISTRATIVE - CONTROL CENTER, COMPLETE	JOB	LS	$ 702,600.00
2	LOW-SERVICE PUMP FACILITY, COMPLETE	JOB	LS	557,700.00
3	PRESSURE FILTERS, PIPING & RELATED ITEM, COMPLETE	JOB	LS	3,275,000.00
4	CHLORINE FACILITIES, COMPLETE	JOB	LS	150,000.00
5	318,000 GALLON GROUND STORAGE TANK, COMPLETE	2 EA	$ 667,700.00	1,335,400.00
6	HIGH-SERVICE PUMP FACILITY REFURBISHMENT, COMPLETE	JOB	LS	626,800.00
7	LIME STORAGE & FEED FACILITIES, COMPLETE	JOB	LS	1,916,200.00
8	CARBON DIOXIDE STORAGE & FEED FACILITY, COMPLETE	JOB	LS	162,500.00
9	REFURBISH CLARIFIER NO. 2, DRIVE UNIT & RELATED WORK.	JOB	LS	521,600.00
9A	CLEAN & RECOAT INTERIOR & EXTERIOR, TO INCLUDE WALKWAYS, CLARIFIER NO. 2, COMPLETE	JOB	LS	340,500.00
9B	DRAIN, CLEAN & RE-COAT INTERIOR & EXTERIOR, TO INCLUDE WALKWAYS, CLARIFIER NO. 1, COMPLETE	JOB	LS	340,500.00
10	REMOVE & DISPOSE OF AERATOR, FURNISH & INSTALL NEW 1,060 GPM AERATOR, COMPLETE	JOB	LS	402,400.00
10A	REMOVE EXISTING AERATOR, RE-INSTALL AERATOR, COMPLETE	JOB	LS	46,800.00
10B	CONSTRUCT NEW AERATOR STRUCTURE & STAIRWAY, COMPLETE	JOB	LS	172,000.00
11	REFURBISH LIME BUILDING, TO INCLUDE CHEMICAL FEED EQUIPMENT (ALUM), COMPLETE	JOB	LS	165,000.00
12	REFURBISH SLUDGE HANDLING FACILITIES LOCATED IN LIME BUILDING, COMPLETE	JOB	LS	142,000.00
12A	REFURBISH SLUDGE BUILDING & SLUDGE HANDLING FACILITIES, COMPLETE	JOB	LS	88,000.00
12B	VOLUTE DEWATERING SLUDGE SYSTEM, CONVEYOR, TRAILER, COMPLETE	JOB	LS	1,378,000.00
13	44,000 GALLON EPOXY COATED CLEAR WELL (G.S.T.), W/ FOUNDATIONS, COMPLETE	2 EA	$ 288,300.00	576,600.00
14	AUTOMATIC SLIDE GATE, FRONT ENTRANCE, COMPLETE W/ SIGN	JOB	LS	45,000.00
15	DEMOLITION & DISPOSAL (OFF-SITE), ALL DEMOLISHED COMPONENTS, COMPLETE	JOB	LS	104,000.00
16	MISC. CONCRETE, SITE WORK, ACCESS ROAD, YARD PIPING, MISCELLANEOUS ITEMS, COMPLETE	JOB	LS	460,000.00
17	ELECTRICAL SERVICE, CIRCUITS, CONDUITS, PANELS, TRANSFORMERS, ANY & ALL COMPONENTS, COMPLETE	JOB	LS	3,440,000.00
17A	DIESEL GENERATORS, W/ FUEL, ATS (GTS), (3 TOTAL), COMPLETE	JOB	LS	520,000.00
17B	GENERATOR BUILDING, FOUNDATION (32'-0" x 42'-6"), COMPLETE	JOB	LS	103,000.00
17C	4,000 GALLON BULK DIESEL TANK W/ CONTAINMENT & FUEL, COMPLETE	JOB	LS	96,300.00
18	STORAGE BUILDING, FOUNDATION (30'-0" x 32'-0"), COMPLETE	JOB	LS	81,000.00
19	BULK MATERIAL STORAGE FACILITY, COMPLETE	JOB	LS	36,000.00
20	RELOCATE EMERGENCY DIESEL PUMP, COMPLETE	JOB	LS	100,000.00
21	FIELD OFFICE W/ AGGREGATE PARKING, COMPLETE	JOB	LS	32,500.00
22	EROSION CONTROL, MEASURES, SWPPP, COMPLETE	JOB	LS	12,000.00
23	LP, 6,000 LB. CAPACITY FORKLIFT, COMPLETE	JOB	LS	38,000.00
24	START-UP, FACTORY REPS. (MIN. 24 HOURS), INITIAL CHEMICAL SUPPLY, O&M MANUALS C5), COMPLETE	JOB	LS	38,000.00
25	PROJECT SIGN	1 EA	$ 1,000.00	1,000.00
	SUBTOTAL WATER PLANT			18,006,400.00
26	DISTRIBUTION - 2" GATE VALVE W/ BOX	5 EA	$ 2,500.00	12,500.00
27	DISTRIBUTION - 3" GATE VALVE W/ BOX	2 EA	$ 2,500.00	5,000.00
28	DISTRIBUTION - 6" GATE VALVE W/ BOX	39 EA	$ 3,600.00	140,400.00
29	DISTRIBUTION - 8" GATE VALVE W/ BOX	8 EA	$ 5,000.00	40,000.00
30	DISTRIBUTION - 10" GATE VALVE W/ BOX	2 EA	$ 6,300.00	12,600.00
31	DISTRIBUTION - 12" GATE VALVE W/ BOX	8 EA	$ 7,300.00	58,400.00
32	DISTRIBUTION - 2" DIA. FLUSH ASSEMBLY W/ GATE VALVE AND BOX	2 EA	$ 2,600.00	5,200.00
33	DISTRIBUTION - 3-WAY FIRE HYDRANT, W/6" G.V. AND BOX, COMPLETE	1 EA	$ 8,400.00	8,400.00
34	DISTRIBUTION - VALVE SIGN & POST	67 EA	$ 120.00	8,040.00
35	DISTRIBUTION - TRAFFIC CONTROL, SIGNS & BARRICADES	JOB	LS	13,000.00
36	DISTRIBUTION - PAVEMENT REPAIR, GENERAL	8 EA	$ 9,800.00	78,400.00
	SUBTOTAL DISTRIBUTION			381,940.00
	TOTAL BASE BID AMOUNT			$18,388,340.00

EIGHTEEN MILLION, THREE HUNDRED EIGHTY-EIGHT THOUSAND, THREE HUNDRED FORTY DOLLARS & 00/100

AMOUNT OF PROPOSAL GUARANTEE: 5%

SURETY: Travelers Casualty and Surety Company of America

COMMENTS:

STATE OF LOUISIANA
Kenneth C. McManus
License No. 19876
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING

I hereby certify that the above is a true and correct summary of proposals received.

Ken McManus, PE
Kenneth C. McManus, P.E.

McManus Consulting Engineers, Inc.
P. O. Box 4318 (71211)
116 Smelser Rd.
Monroe, LA 71202
Phone: (318) 343-5600, 343-5460
Fax: (318) 343-5717

City of Tallulah
Contract D – Rehabilitation Of Water Treatment Plant
Project No. 18-04-663E

BID OPENING

Date: Thursday, April 11, 2024 @ 10:00 AM
Location: Tallulah Town Hall, 204 N. Cedar Ave., Tallulah, LA 71282

ATTENDANCE

Cinnamon Gooding	McManus Engineers	318-343-5600
Michael Landi	McManus Engineers	318-343-5600
Ken McManus	MCE	318-343-5600
Donald Odom	City	(318) 574-0964
Chuck Taylor	City	(318)341-6161
Jack Scott	city	318.282.6992
RYAN ALFORD	WOMACK AND SONS	318-376-5859
Ryan Hamilton	Womack & Sons	318-481-2969
Louis Tolliver	Womack & Sons	318 267 4438

McManus Consulting Engineers, Inc.
Monroe, LA 71202

BID OPENING REPORT

BIDS WERE OPENED ON: April 11, 2024 TIME: 10:00 AM
FOR: City of Tallulah PROJECT NO. 18-04-663E
PRE-BID ESTIMATE: $ 17,500,000 PROJECT NAME: Contract D - Rehabilitate Water Treatment Plant

1. Womack and Sons Construction Group, LLC
   5739 Highway 8 East
   Harrisonburg, LA 71340
   Base Bid $ 19,895,729.00
   ☒ Acknowledged Addenda No. 1

2. Morgan Contracting, Inc.
   900 Dutch Valley Drive
   Knoxville, TN 37918
   Base Bid $ No Bid
   ☐ Acknowledged Addenda No. 1

3. Hemphill Construction Company, Inc.
   1858 US 49
   Florence, MS 39073
   Base Bid $ No Bid
   ☐ Acknowledged Addenda No. 1

4. Dixie Overland Construction, LLC
   380 Burson Road
   Sibley, LA 71073
   Base Bid $ No Bid
   ☐ Acknowledged Addenda No. 1

Signed: Cinnamon Gooding, P.E.
Dated: April 11, 2024

NOTE: THE ABOVE BID AMOUNTS HAVE NOT BEEN CHECKED. THE BID TOTALS ARE SUBJECT TO CORRECTION AFTER THE BIDS HAVE BEEN COMPLETELY REVIEWED.

CITY OF TALLULAH
CONTRACT D - REHABILITATION OF WATER TREATMENT PLANT
PROJECT NO. 18-04-663E

BID TABULATION
(RE-BID)

Bids Opened
Date: Thursday, April 11, 2024
Time: 10:00 AM
Place: City of Tallulah, 204 North Cedar Street, Tallulah, LA 71282

Computed By: Ken McManus, P.E.

ITEM NO.	DESCRIPTION	QUANTITY & UNIT	1 WOMACK AND SONS CONSTRUCTION GROUP, LLC HARRISONBURG, LA UNIT PRICE	TOTAL
1	ADMINISTRATIVE - CONTROL CENTER, COMPLETE	JOB	LS	$ 850,500.00
2	LOW-SERVICE PUMP FACILITY, COMPLETE	JOB	LS	780,300.00
3	PRESSURE FILTERS, PIPING & RELATED ITEM, COMPLETE	JOB	LS	3,637,500.00
4	CHLORINE FACILITIES, COMPLETE	JOB	LS	171,000.00
5	318,000 GALLON GROUND STORAGE TANK, COMPLETE	2 EA	$ 829,500.00	1,659,000.00
6	HIGH-SERVICE PUMP FACILITY REFURBISHMENT, COMPLETE	JOB	LS	745,500.00
7	LIME STORAGE & FEED FACILITIES, COMPLETE	JOB	LS	1,938,000.00
8	CARBON DIOXIDE STORAGE & FEED FACILITY, COMPLETE	JOB	LS	204,500.00
9	REFURBISH CLARIFIER NO. 2, DRIVE UNIT & RELATED WORK.	JOB	LS	555,900.00
9A	CLEAN & RECOAT INTERIOR & EXTERIOR, TO INCLUDE WALKWAYS, CLARIFIER NO. 2, COMPLETE	JOB	LS	488,800.00
9B	DRAIN, CLEAN & RE-COAT INTERIOR & EXTERIOR, TO INCLUDE WALKWAYS, CLARIFIER NO. 1, COMPLETE	JOB	LS	436,250.00
10	REMOVE & DISPOSE OF AERATOR, FURNISH & INSTALL NEW 1,060 GPM AERATOR, COMPLETE	JOB	LS	427,000.00
10A	REMOVE EXISTING AERATOR, RE-INSTALL AERATOR, COMPLETE	JOB	LS	55,000.00
10B	CONSTRUCT NEW AERATOR STRUCTURE & STAIRWAY, COMPLETE	JOB	LS	229,000.00
11	REFURBISH LIME BUILDING, TO INCLUDE CHEMICAL FEED EQUIPMENT (ALUM), COMPLETE	JOB	LS	197,000.00
12	REFURBISH SLUDGE HANDLING FACILITIES LOCATED IN LIME BUILDING, COMPLETE	JOB	LS	150,000.00
12A	REFURBISH SLUDGE BUILDING & SLUDGE HANDLING FACILITIES, COMPLETE	JOB	LS	95,500.00
12B	VOLUTE DEWATERING SLUDGE SYSTEM, CONVEYOR, TRAILER, COMPLETE	JOB	LS	1,394,700.00
13	44,000 GALLON EPOXY COATED CLEAR WELL (G.S.T.), W/ FOUNDATIONS, COMPLETE	2 EA	$ 337,000.00	674,000.00
14	AUTOMATIC SLIDE GATE, FRONT ENTRANCE, COMPLETE W/ SIGN	JOB	LS	48,500.00
15	DEMOLITION & DISPOSAL (OFF-SITE), ALL DEMOLISHED COMPONENTS, COMPLETE	JOB	LS	121,000.00
16	MISC. CONCRETE, SITE WORK, ACCESS ROAD, YARD PIPING, MISCELLANEOUS ITEMS, COMPLETE	JOB	LS	483,500.00
17	ELECTRICAL SERVICE, CIRCUITS, CONDUITS, PANELS, TRANSFORMERS, ANY & ALL COMPONENTS, COMPLETE	JOB	LS	2,958,000.00
17A	DIESEL GENERATORS, W/ FUEL, ATS (GTS), (3 TOTAL), COMPLETE	JOB	LS	571,000.00
17B	GENERATOR BUILDING, FOUNDATION (32'-0" x 42'-6"), COMPLETE	JOB	LS	126,000.00
17C	4,000 GALLON BULK DIESEL TANK W/ CONTAINMENT & FUEL, COMPLETE	JOB	LS	102,200.00
18	STORAGE BUILDING, FOUNDATION (30'-0" x 32'-0"), COMPLETE	JOB	LS	98,400.00
19	BULK MATERIAL STORAGE FACILITY, COMPLETE	JOB	LS	40,400.00
20	RELOCATE EMERGENCY DIESEL PUMP, COMPLETE	JOB	LS	108,000.00
21	FIELD OFFICE W/ AGGREGATE PARKING, COMPLETE	JOB	LS	35,000.00
22	EROSION CONTROL, MEASURES, SWPPP, COMPLETE	JOB	LS	13,700.00
23	LP, 6,000 LB. CAPACITY FORKLIFT, COMPLETE	JOB	LS	39,600.00
24	START-UP, FACTORY REPS. (MIN. 24 HOURS), INITIAL CHEMICAL SUPPLY, O&M MANUALS C5), COMPLETE	JOB	LS	43,500.00
25	PROJECT SIGN	1 EA	$ 3,800.00	3,800.00
	SUBTOTAL WATER PLANT			19,482,050.00
26	DISTRIBUTION - 2" GATE VALVE W/ BOX	5 EA	$ 2,700.00	13,500.00
27	DISTRIBUTION - 3" GATE VALVE W/ BOX	2 EA	$ 2,700.00	5,400.00
28	DISTRIBUTION - 6" GATE VALVE W/ BOX	39 EA	$ 4,000.00	156,000.00
29	DISTRIBUTION - 8" GATE VALVE W/ BOX	8 EA	$ 5,400.00	43,200.00
30	DISTRIBUTION - 10" GATE VALVE W/ BOX	2 EA	$ 6,700.00	13,400.00
31	DISTRIBUTION - 12" GATE VALVE W/ BOX	8 EA	$ 8,000.00	64,000.00
32	DISTRIBUTION - 2" DIA. FLUSH ASSEMBLY W/ GATE VALVE AND BOX	2 EA	$ 2,800.00	5,600.00
33	DISTRIBUTION - 3-WAY FIRE HYDRANT, W/ 6" G.V. AND BOX, COMPLETE	1 EA	$ 8,600.00	8,600.00
34	DISTRIBUTION - VALVE SIGN & POST	67 EA	$ 137.00	9,179.00
35	DISTRIBUTION - TRAFFIC CONTROL, SIGNS & BARRICADES	JOB	LS	14,800.00
36	DISTRIBUTION - PAVEMENT REPAIR, GENERAL	8 EA	$ 10,000.00	80,000.00
	SUBTOTAL DISTRIBUTION			413,679.00
	TOTAL BASE BID AMOUNT			$19,895,729.00

NINETEEN MILLION, EIGHT HUNDRED NINETY-FIVE THOUSAND, SEVEN HUNDRED TWENTY-NINE DOLLARS & 00/100

AMOUNT OF PROPOSAL GUARANTEE: 5%

SURETY: Travelers Casually and Surely Company of America

COMMENTS:

I hereby certify that the above is a true and correct summary of proposals received.

Ken McManus, PE
Kenneth C. McManus, P.E. 04.15.24


BURNS McDONNELL